Supreme Court, U.S.
FILED

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No. ———

In the Supreme Court of the United States

ALLOC, INC., BERRY FINANCE N.V.,
and VÄLINGE INNOVATIONS AB,
fka VÄLINGE ALUMINIUM, AB,
Petitioners,

v.

INTERNATIONAL TRADE COMMISSION, and
PERGO, INC., and ROYSOL, and
AKZENTA PANEELE + PROFILE GmbH,
and UNILIN DÉCOR N.V., BHK OF AMERICA,
and MEISTER-LEISTEN SCHULTE, GmbH,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR WRIT OF CERTIORARI with APPENDICES A-D

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QUESTIONS PRESENTED

1. Whether the Federal Circuit's approach to claim interpretation departs from the claim-based system in violation of statute and this Court's precedent.
2. Whether the Federal Circuit has improperly limited the patent claims by importing a limitation from the specification into the claims, contrary to this Court's precedent.
3. Whether the Federal Circuit has improperly interpreted method patent claims as limited to use with the apparatus disclosed in the specification, contrary to this Court's precedent.
4. Whether the Federal Circuit has improperly imported a limitation into a patent claim when the same limitation appears in another claim, rendering the claims identical in scope in violation of its own precedent held to be "fixed" and "immutable."
5. Whether the Federal Circuit in this case rendered a decision that is "without any articulable legal justification" and thereby decided important federal law questions in a way that conflicts with relevant decisions of this Court.

PARTIES TO THE PROCEEDING AND RULE 29.6 STATEMENT

Petitioners are: Alloc, Inc., a Delaware corporation; Berry Finance, N.V., a Belgian corporation; and Välinge Innovation AB (formerly Välinge Aluminium AB), a Swedish corporation. The parent of Alloc, Inc. is Alloc AB, a Norwegian company. Berry Finance N.V. is a member of the Berry Group, a Belgian group of companies. The parent of Välinge Innovation AB is Välinge Holding AB. No publicly held company owns 10 percent or more of any of the petitioners.

Respondent is the United States International Trade Commission. Intervenors in the appeal below and Respondents in underlying proceeding are: Unilin Décor N.V.; BHK of America, Inc.; Meister-Leisten Schulte GmbH; Pergo, Inc.; Akzenta Paneele + Profile GmbH; and Roysol, S.A. (collectively "Respondents").

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PETITION FOR WRIT OF CERTIORARI

Petitioners, Alloc, Inc., Berry Finance, N.V., and Välinge Innovation AB (collectively "Alloc"), respectfully petition for a writ of *certiorari* to review the judgment of the Court of Appeals for the Federal Circuit ("the Federal Circuit").

OPINION BELOW

The opinion of the Federal Circuit is reported at 342 F.3d 1361 and reproduced in Petitioners' Appendix (hereinafter "App.") at 3a-40a. The order denying panel rehearing and denying rehearing *en banc* is reported at 2003 U.S. App. LEXIS 25565 and is reproduced in App. at 1a-2a.

JURISDICTION

Judgment of the Federal Circuit was entered on September 10, 2003, and the order denying panel rehearing and denying rehearing *en banc* issued on November 17, 2003. The jurisdiction of this Court is invoked pursuant to 28 U.S.C. §1254(1).

STATUTE INVOLVED

35 U.S.C. §112, ¶¶1-2 of the Patent Laws of the United States provides as follows regarding U.S. patent applications:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.
>
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming

the subject matter which the applicant regards as his invention.

STATEMENT OF THE CASE

The Proceedings Below

Alloc filed a Complaint on December 4, 2000 in the United States International Trade Commission (the "ITC") under Section 337 of the Tariff Act of 1930. 19 U.S.C. §1337 (2003). The Complaint charged Respondents with infringement of three patents pertaining to mechanically-locking flooring products. The case was decided in favor of the accused infringer based on a single issue of law relating to how the claims of the asserted patents should be construed and, in particular, whether a limitation should be read into the claims based on the specification of the patent and its prosecution history.

An Administrative Law Judge ("ALJ") held an evidentiary hearing from July 26 through August 1, 2001 and issued a Final Initial Determination of non-infringement ("ID") on November 2, 2001. App. at 72a-322a. The ALJ construed all the claims by reading into them a limitation requiring "play", a small separation, in the joint. App. at 94a-158a.

Having determined as a matter of law that the claims all included an unstated "play" limitation, the ALJ found, as a matter of fact, that it had not been proven that the accused products had "play." App. at 181a-201a. On that basis, the ALJ ruled that none of the Respondents' products infringed Alloc's patents. App. at 193a, 201a.

Alloc and the ITC's Investigative Staff filed Petitions for Review to the International Trade Commission. On December 20, 2001, the Commission issued a Notice of Decision to review portions of the Initial Determination. On March 22, 2002, the Commission issued a Notice of Final

Determination of No Violation of Section 337, finding no patent infringement. On April 11, 2002, the Commission issued an Opinion on the Issues Under Review. App. at 41a-71a.

The Commission upheld the ALJ's finding of non-infringement. App. at 41a-42a. The Commission largely adopted the ALJ's interpretation claim interpretation. App. at 46a-54a. The Commission read an unstated play limitation into each of the asserted claims of the three patents in suit. App. at 46a-54a.

On appeal, the Federal Circuit affirmed the Commission's decision on September 10, 2003 in a majority opinion by Circuit Judge Rader joined by Circuit Judge Michel, App. at 3a-27a, with a vigorous dissent by Circuit Judge Schall. App. at 27a-40a. The Federal Circuit denied a petition for rehearing and rehearing *en banc* on November 17, 2003, noting that Circuit Judge Gajarsa would have reheard the appeal *en banc*. App. at 1a-2a.

Statement of the Facts

The patents asserted in this case are: U.S. Pat. Nos. 6,023,907 ("the '907 patent"); 6,182,410 ("the '410 patent"); and 5,860,267 ("the '267 patent"). App.323a-424a.[1] All three pertain to flooring panels that can be joined, without glue, by mechanically interlocking edges and methods for installing mechanically-locking flooring panels. The panels that are the subject of these patents include laminate flooring products now widely sold for "do-it-yourself" installation. Prior to the inventions in these patents, panels of this type were typically glued together, App. at 325a (col. 1, lns.

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[1] For ease of reference, all citations to the patent specification of the patents in suit will identify the relevant language from the '907 patent specification.

52-54), or held together by separate metal clamps or clips. App. at 325a (col. 1, lns. 35-45).

The '410 patent is directed to edge lock configurations. App. at 390a-424a. The '907 and the '267 patents are directed to methods of installing, and in some instances disassembling, the mechanically-locking flooring panels. App. at 323a-389a. The asserted patents share a common specification and have the same parent, U.S. Pat. No. 5,706,621 ("the '621 patent"). The three asserted patents and the parent patent are based on a PCT application (International Patent Application). App. at 324a. Figs. 1a and 1b in the common specification are examples of edge locks, and Fig. 5 in the common specification is an example of an installation method. App. at 324a (foldout diagrams).

"Play," the structural detail that was imported into the asserted claims by the Federal Circuit, is mentioned in the specification three times: col. 4, ln. 16; col. 5, ln. 28; and col. 7, ln. 39. App. at 330a, 333a, 337a. Only Fig. 1b identifies "play" with the symbol delta, "Δ." App. at 324a (fold out diagram). Ten claims from the three patents were asserted in this case: claims 1-3 of the '907 patent; claims 19, 23, and 39 of the '267 patent; and claims 1, 26, 41, and 48 of the '410 patent. App. at 343a-344a, 376a-379a, 387a-388a, 410a-411a, 415a-417a, 420a, 421a. None of the asserted claims contains a "play" limitation. None of the asserted claims was amended to either add or delete "play." No arguments were made to obtain allowance of the asserted claims based on a construction of these claims such that a play limitation should be expressly or impliedly present.

The inventor of the asserted patents, Tony Pervan, testified that he understood U.S. patent law required him to include in the patent what he believed to be the best way to

make the invention. App. at 492a-493a. For that reason, Mr. Pervan mentioned "play" in the specification. App. at 493a.

In the examination of the asserted claims, play was never mentioned for any reason by either the applicant or the Examiner. However, "play" is mentioned in the file history of the parent of the asserted patents, the '621 patent. The application that resulted in the '621 patent initially included only one independent claim, claim 1, which included a limitation calling for "play." App. at 445a. The examiner issued an office action, rejecting claim 1 of the parent application in light of a prior patent issued to Trotter. App. at 454a-456a. Trotter disclosed a system of holding floor panels together and preventing displacement by means of spring clips that fit on the underside of the panels. App. at 468a-477a. In responding to the office action, the applicant distinguished Trotter from claim 1 of the '621 patent on several bases, one of which was that Trotter lacked "play." App. at 457a-461a. Thereafter, the Examiner issued a notice of allowance as to claim 1, which did not identify "play" as a basis for allowance. App. at 462a-463a.

Because the "play" feature in claim 1 was not among the reasons for allowance of that claim, the applicant concluded that "play" was not necessary for patentability. While the '621 patent application was still pending, the applicant submitted additional claims in that same application, including independent claim 22, that did not include a "play" limitation but did include those other features that the Examiner had noted in the reasons for allowance of claim 1. App. at 464a-467a. In submitting the new additional claims, the applicant called to the Examiner's attention that the play limitation did not appear in these claims, stating as follows:

> New independent claim 22 is substantially the same as independent claim 1 except that it does not define the

> play that exists between the locking groove and the locking surface. As such, displacement of the panels is still facilitated in a direction along the joints which is what is believed to be meant by the Examiner's Statement of Reasons for the indication of allowable subject matter. Accordingly, claim 22 is also patentable over the cited prior art."

App. at 466a-467a.[2] Claim 22 of the '621 patent was thereafter allowed as submitted, without the "play" limitation. App. at 450a-451a.

The asserted patents in this case are all based on the same application that resulted in the '621 patent, which was not asserted in this case.[3] In the applications that resulted in the asserted patents, the applicant submitted and prosecuted a variety of claims, none of which included a play limitation with the exception of dependent claim 49 of the '410 patent. App. at 343a-349a, 370a-389a, 410a-424a.

The Federal Circuit's Decision

In a divided panel, the majority read "play" into all the asserted claims. The majority opinion, by Circuit Judge Rader, affirms non-infringement solely based on a determination that all the claims should be interpreted as including a "play" limitation. App. at 13a, 27a. In a

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[2] This statement accompanied the presentation of claim 22 of the '621 parent patent in the "remarks" section after claim 1 had been allowed by the Examiner and after the Examiner had stated her reasons for allowance of claim 1 without mentioning the play limitation. App. at 462a to 467a.

[3] The '621 patent was in a combined reissue/reexamination proceeding in the USPTO when this case was filed. That proceeding is not yet concluded.

vigorous dissent, Circuit Judge Schall criticized the majority as allowing "the accused infringer to narrow the scope of the claims to a preferred embodiment disclosed in the specification." App. at 29a.

In its claim construction, the majority cited to the specification where "play" is mentioned and the one drawing where play is identified. App. at 13a-15a. The majority determined that "the specification teaches that the invention as a whole . . . provides for play in the positioning of floor panels." App. at 13a. The majority also determined that all the figures and preferred embodiments in the specification "imply play." App. at 15a. The majority held that the specification "teaches" that "play" permitted displacement of the panels when they are joined together and that "play" also permitted the panels to be disassembled. App. at 14a,-15a. The majority stated that the specification justified the "inescapable conclusion" that the asserted claims must include "play," although the dissent strongly disagreed. App. at 17a, 27a-40a.

The majority also relied on the file history of the parent '621 patent to support its reading of "play" into the claims of the asserted patents. App. at 18a-21a. The portion of the file history upon which the majority relied, however, relates to claim 1 of the '621 patent, which expressly includes a "play" limitation. App. at 18a-19a, 445a-446a, 457a-461a. Nevertheless, the majority applied the applicant's argument in the file history made with respect to a claim with an express "play" limitation to the asserted claims, which do not include such limitation. App. at 19a-20a.

In discussing the file history of the '621 patent, the majority acknowledges that the applicant pursued an additional claim, claim 22, which differed from claim 1 only in that it did not include a "play" limitation. App. at 18a.

Despite the absence of a "play" limitation in claim 22, the majority, nevertheless, construed that claim as also having a "play" limitation. The majority went on to conclude that the implied "play" limitation in claim 22 of the parent '621 patent should also apply to the asserted patents in this case. App. at 20a. The court reasoned that, in the parent file history, the applicant had tied displacement and disassembly of the panels to the "play" feature, and, because all the asserted claims called for disassembly or displacement, they should also be restricted by importing an unstated "play" limitation. App. at 20a-21a.

The dissent strongly disagreed with the majority on every substantive issue. The dissent found no support in the specification for the proposition that "play" was required for the claimed inventions and also found no basis for interpreting the claims by other than their ordinary meaning, which does not include the feature "play." App. at 29a-38a.

The dissent noted that the majority's treatment of the file history contravened settled Federal Circuit precedent. App. at 38a-39a. Rather than establishing "clear and unmistakable disclaimer" of systems that have play, as the case law requires before relying on the file history to limit claims, the dissent found that the file history suggested the contrary - *i.e.*, that claim 22 of the parent '621 patent does not require play. App. at 39a-40a. The dissent also noted that, even if claim 22 of the parent '621 patent is limited to systems with play, that restriction would not apply to the asserted claims because they do not share with the parent a common term limited during prosecution. App. at 40a.

The majority does not address the numerous substantive issues identified in the dissent.

REASONS FOR GRANTING THE WRIT

I. THIS COURT SHOULD PROVIDE GUIDANCE AND CLARITY TO IMPORTANT ISSUES OF PATENT CLAIM INTERPRETATION

In recent years, this Court has addressed that aspect of patent law known as the doctrine of equivalents, *i.e.*, how far outside the literal scope of a patent claim may infringement be found. This Petition goes to a more central aspect of patent law, indeed the most central aspect - claim interpretation, which is the question of how courts determine what is within the literal scope of a patent claim. Claim interpretation arises in virtually every patent case, and it is outcome-determinative in most cases.[4]

There is disarray in the Federal Circuit's case law on claim interpretation, which has resulted in uncertainty in the scope of the claims. This uncertainty is manifesting itself in an extraordinary rate of reversal on claim interpretation.[5] In another context, this Court has noted that a high reversal rate can be an indicator of "inadequate guidance" from the courts that can "invite and prolong needless litigation." *OPM v. Richmond*, 496 U.S. 414, 422-23 (1990).

The confusion in the Federal Circuit's cases on claim construction, particularly on the relationship between the

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[4] "[T]o decide what the clams mean is nearly always to decide the case." *Markman v. Westview Instr., Inc.*, 52 F.3d 967, 989 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996) (Mayer, J., concurring).

[5] Christian A. Chu, *Empirical Analysis Of The Federal Circuit's Claim Construction Trends,* 16 Berkeley Tech. L.J. 1075, 1142 (2001); *see also* Gretchen A. Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time is Ripe for a Consistent Claim Construction Methodology*, 8 J. Intell. Prop. L. 175 (2001).

specification and the claims, is an open secret. Circuit Judge Dyk candidly admitted this claim construction confusion in his concurring opinion for a case relied upon heavily by the majority in this case:

> The problem is that our decisions provide inadequate guidance as to when it is appropriate to look to the specification to narrow the claim by interpretation and when it is not appropriate to do so. Until we provide better guidance, I fear that the lower courts and litigants will remain confused.

Scimed v. Advanced Cardiovascular Sys. Inc., 242 F.3d 1337, 1347 (Fed. Cir. 2001).

This unpredictability defeats the Congressional purpose in the creation of the Federal Circuit.[6] This Court should grant this Petition in order to restore the prominent role of the claims language itself in determining claim scope and to bring clarity to the ways in which the claims can be limited by the specification or the file history.

Granting *certiorari* in this case will also benefit district court judges who will be adjudicating infringement cases involving these same patents. There are now pending five district court actions[7] for infringement of the same patents

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[6] Federal Courts Improvement Act of 1982, Pub. L. 97-164, 96 Stat. 25 (1982)(codified at 28 U.S.C. § 1295(a)(1) (1994)); H.R. Rep. No. 97-312, at 22-23 (1981) ("A single court of appeals for patent cases will promote certainty where it is lacking to a significant degree....)".

[7] *Alloc, Inc. et al. v. Unilin Décor, N.V. et al.*, Case No. 00-CV-0999 (E.D. Wis.); *Alloc, Inc. et al. v. Tarkett, Inc.*, Case No. 00-C-1377 (E.D. Wis.); *Alloc, Inc. et al. v. Columbia Forest Prod., Inc.*,, Case No. 01-C-0216 (E.D. Wis.); *Alloc, Inc., et al. v. Shaw Indus., Inc.*, Case No.

construed by the Federal Circuit in this case.[8]

II. THE FEDERAL CIRCUIT HAS DEPARTED FROM THE CLAIMS-BASED SYSTEM, CONTRARY TO STATUTE AND THIS COURT'S PRECEDENT.

In the last few years, the Federal Circuit has expanded the relative weight accorded to a patent's specification and file history and has diminished the relative importance of the claims. This shift has not gone unnoticed among those who follow that court. The following passage appears in the most recent edition of a treatise devoted to the Federal Circuit:

> *Cautionary Note*: Despite the Federal Circuit's repeated protestations to the contrary, the author has come to the belief that sometimes it does in fact import limitations from the specification into the claims. In other words, it limits the claim coverage to the embodiment described in the specification without any articulable legal justification.
>
> The author fully expects that the court, were it ever to be confronted with this view, would firmly disagree. Indeed, many or most practitioners might feel the author has misread the decisions. Nonetheless, the author feels strongly enough about this conclusion that he feels obliged to state it, and to offer some examples. Accordingly, those readers who are interested in the topic are invited to read and analyze

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01-C-0486 (E.D. Wis.); and *Alloc, Inc., et al. v. Norman D. Lifton Co., et al.*, Case No. 03-CV-4419 (S.D.N.Y.).

[8] Because this case originated in the ITC, the decisions of the ITC and by the Federal Circuit on appeal from the ITC are not binding on the district courts on issues of fact or law. *Texas Instr. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1569 (Fed. Cir. 1996).

> the cases collected in the footnote, and to make their own judgments.
>
> The author also believes that the Federal Circuit is developing alternative techniques to achieve the same end result, i.e. no liability for infringement. See the discussion of *Gentry Gallery* in §5.4(e).

ROBERT L. HARMON, PATENTS AND THE FEDERAL CIRCUIT at 292 (2003) (footnote and citations omitted). Notably, the Federal Circuit cases identified as "without any articulable legal justification" include the same cases the ALJ relied upon in limiting the claims in this case.[9] Other commentators and practitioners have noticed the same inconsistency in the Federal Circuit's application of claim construction principles.[10]

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[9] *Bell Atl. Network Servs. v. Covad Communs. Group, Inc.*, 262 F.3d 1258 (Fed. Cir. 2001); *SciMed Life Sys. Inc. v. Advanced Cardiovascular Sys.*, 242 F.3d 1337 (Fed. Cir. 2001); *Watts v. XL Sys., Inc.*, 232 F.3d 877 (Fed. Cir. 2000); *Wang Labs, Inc. v. Am. Online, Inc.*, 197 F.3d 1377 (Fed. Cir. 1999); *Toro Co. v. White Consol. Indus. Inc.*, 199 F.3d 1295 (Fed. Cir. 1999). App. at 95a, 167a-181a.

[10] Steven B. Pokotilow & Charles E. Cantine, *File Early and File Often A Pending Application is the Best Approach to Capturing Your Competitor's Product*, PATENT STRATEGY & MGMT, Jan. 28, 2004, at 1 (*e.g.*, - "In sum, due to the ever-changing case law on claim interpretation, neither applicants nor their attorneys are in a position to predict accurately how a district court, or the Federal Circuit, will interpret a given set of claims."); Andrew T. Zidel, *Patent Claim Construction in the Trial Courts: A Study Showing the Need for Clear Guidance From the Federal Circuit*, 33 Seton Hall L. Rev. 711 (2003) (citing numerous studies showing the Federal Circuit's high reversal rate on claim construction issues); Tarek N. Fahmi & Elena B. Dreszer, *De Novo Review of Claims Construction or Wasted Effort of the District Court: Interactive Gift Express, Inc. v. Compuserve, Inc.*, 19 Santa Clara

The author quoted above is a long-time observer of the Federal Circuit. His treatise has been cited by the Federal Circuit several times[11] and also by this Court.[12] Alloc's case is the most recent, and the most extreme, example of the trend Mr. Harmon has identified.

Computer & High Tech. L.J. 315 (2002) (*e.g.*, - "[E]mpirical studies by various authors, including one of the Federal Circuit's own judges, have shown that uniformity is conspicuously absent when it comes to issues of claims construction in patent litigation..."); Gregory J. Gallagher, *The Federal Circuit and Claim Construction: Resolving the Conflict between the Claims and the Written Description*, 4 N.C. J.L. & Tech. 121 (2002) (*e.g.*, - "Unfortunately, the claim construction process has been far from clear, and, as a result, the amount of litigation regarding claim construction is voluminous."); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 Harv. J. Law & Tec. 1 (2001) (*e.g.*, - "The high reversal rate on claim construction is problematic. It creates uncertainty in patent cases and in patent claim scope analysis until the Federal Circuit review is complete. This hinders ex ante attempts to ascertain permissible behavior and ex post attempts to litigate infringement.); Gretchen Ann Bender, *Uncertainty and Unpredictability In Patent Litigation: The Time Is Ripe For A Consistent Claim Construction Methodology*, 8 J. Intell. Prop. L. 175 (2001) (discussing the lack of predictability in claim construction as demonstrated by the Federal Circuit's high reversal rate).

[11] *Wang Labs. v. Mitsubishi Elec.*, 103 F.3d 1571, 1580 (Fed. Cir. 1997); *Atlantic Thermoplastics v. Faytex*, 5 F.3d 1477, 1483 (Fed. Cir. 1993) (J. Rader in dissent); *Buildex Inc. v. Kason Indus.*, 849 F.2d 1461, 1462 (Fed. Cir. 1988); *Oscar Meyer Foods Corp. v. Conagra*, 1994 U.S. App LEXIS 36261 (Fed. Cir. Dec. 22, 1994) (unpublished); *Braun Inc. v. Braun AG*, 975 F.2d 815, 819 (Fed. Cir. 1992).

[12] *Cardinal Chemical v. Morton Int'l.*, 508 U.S. 83, 102, n. 25 (1993).

Claiming became a requirement for all patents in the Patent Act of 1870. Act of July 8, 1870, ch. 230, §26, 16 Stat. 201; *Markman v. Westview Instr.*, 52 F.3d 967, 996 (Fed. Cir. 1995). When Congress passed the Patent Act of 1952, it included the requirement to define an invention "particularly" and "distinctly" with one or more claims. 35 U.S.C. §112, ¶2. The section on claiming in the 1952 Act was broken out into a separate paragraph to emphasize the distinction between the claims and the specification.[13] "The statute makes provision for specification separately from the claims . . . It would accomplish little to require that claims be separately written if they are not to be separately read." *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 336 U.S. 271, 276 (1949).

With the development of claiming, it became accepted that the claims "measure the invention." *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 369 (1938), *quoting*, *Continental Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 419 (1908). This Court has stressed the importance of the words of the claims in interpreting the claims:

> Some persons seem to suppose that a claim in a patent is like a nose of wax which may be turned and twisted in any direction, by merely referring to the specification, so as to make it include something more than, or something different from, what its word express. The context may, undoubtedly, be resorted to, and often is resorted to, for the purpose of better understanding the meaning of the claims; but not for the purpose of changing it, and making it different

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[13] S. REP. NO. 1979, at 18 (1952) ("The clause relating to the claim [in §112] is made a separate paragraph to emphasize the distinction between the description and the claim or definition, and the language is modified.").

> from what it is. The claim is a statutory requirement, prescribed for the very purpose of making the patentee define precisely what his invention is; and it is unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms.

White v. Dunbar, 119 U.S. 47, 51-52 (1886) (emphasis added).

Because the claims measure the invention, this Court noted the limited role of the specification in interpreting the claims in *Howe Machine v. National Needle*: "[T]he specification and drawings are usually looked at only for the purpose of better understanding the meaning of the claim, and certainly not for the purpose of changing it and making it different from what it is." 34 U.S. 388, 394 (1890) (emphasis added). This point was reaffirmed in *Cimiotti Unhairing v. American Fur Refining*: "In making his claim the inventor is at liberty to choose his own form of expression, and while the courts may construe the same in view of the specifications and the state of the art, they may not add to or detract from the claim." 198 U.S. 399, 410 (1905) (emphasis added).

This Court has staunchly maintained the prohibition against importing limitations from the specification into the claims, even at the expense of rendering the claim invalid: "to save the product claim in this fashion would constitute improper importation into the claim of a factor nowhere described there." *Gen. Elec. Co.*, 304 U.S. at 373-74 (emphasis added); *see also Graver Tank & Mfg. Co.*, 336 U.S. at 277 ("We have frequently held that it is the claim which measures the grant to the patentee.").

The prohibition against importing limitations into the claims applies to both infringement and validity. "[W]e know

of no principle of law which would authorize us to read into a claim an element which is not present, for the purpose of making out a case of novelty or infringement. The difficulty is that if we once begin to include elements not mentioned in the claim in order to limit such claim and avoid a defense of anticipation, we should never know where to stop.... This doctrine is too obviously untenable to require argument." *McCarty v. Lehigh Valley Railroad Co.*, 160 U.S. 110, 116 (1895) (emphasis added).

This Court has recognized only two exceptions to the primacy of the claims in relation to the specification. One exception only applies with respect to a claiming style seldom now seen, which expressly invokes the specification in the claim. *E.g.*, *Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 557-560 (1898).[14] The second exception involves the use of "means-plus-function" limitations, now codified in 35 U.S.C. §112, ¶6 (2003).

The Federal Circuit, in interpreting claims, has articulated an "intrinsic evidence" analysis, based on the claims, the specification, and the file history. *Markman*, 52 F.3d at 979-80. When first stated by the Federal Circuit, the role of the specification in the intrinsic evidence approach was limited to instances where a claim term is defined in a special way in the specification. *Id.* Even that use of the specification was subject to the caveat that "any special definition given to a word must be clearly defined in the specification." *Id.*

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[14] A claim-drafting style from an earlier era included in the claim words such as "...as substantially set forth." Claims drafted in this style were generally interpreted as incorporating by reference in the claim the preferred embodiment described in the specification. *Westinghouse*, 170 U.S. at 557-560.

In the past several years, however, the Federal Circuit has expanded the role of the specification in claim interpretation to the point seen in this case, where the court divines the "invention as a whole" from the specification and where claim interpretation is based on what the court perceives as "implied" in the specification and file history. App. at 13a, 15a.

This case demonstrates that the exception has now swallowed the rule. In the section of the majority's opinion entitled "Claim Construction," the language of the claims is essentially ignored other than a passing acknowledgment that "play" does not appear therein. App. at 13a. Instead, the specification is discussed at length, and the file history is also discussed, although to a lesser extent. App. at 13a-21a. The majority's decision effectively places the specification (and the file history) on equal par with the language of the claims themselves in determining the scope of protection afforded the patentee, which is antithetical to the claiming system.

The resulting claim interpretation is significantly more restricted than would be allowed by the claim language. As the dissent notes, the majority "has allowed the accused infringer to narrow the scope of the claims to a preferred embodiment disclosed in the specification." App. at 29a. That result is precisely what the claiming system is intended to avoid.

The Federal Circuit's deviation from the claims-based system undercuts this Court's recent decisions in the field of patent law in which this Court upheld and clarified the doctrine of equivalents and affirmed that it is the judge, not the jury, that interprets the claims. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722 (2002); *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997); *Markman*, 517 U.S. 370. In these cases, this

Court stressed the uniformity and predictability that result from the statutory requirement that every patented invention be defined "particularly" and "distinctly" in a separate claims section following the specification, as required in 35 U.S.C. § 112, ¶2. *Markman*, 517 U.S. at 384-91. The Federal Circuit's broad use of the specification and file history defeats the purposes explained in these cases.

III. THE FEDERAL CIRCUIT'S APPROACH TO CLAIM INTERPRETATION DISREGARDS A PRINCIPAL HELD TO BE "FIXED" AND "IMMUTABLE."

The Federal Circuit's expanded approach to claim interpretation vitiates a cardinal principle of the claiming system - the prohibition against reading into a claim a limitation that already appears in another claim. None of the asserted claims include a limitation calling for "play." However, one dependent claim in the '410 patent, claim 49, does call for play. App. at 421a. Claim 49 is dependent on independent claim 39, which is asserted in this case.

By reading into one claim, claim 39, a limitation that already appears in another claim, claim 49, the majority contravened a rule in patent law that the late Chief Judge Markey described as "fixed" and "immutable":

> The district court said 'as a general rule a limitation cannot be read into a claim to avoid infringement' ... where, as here, the limitation sought to be 'read into' a claim already appears in another claim, the rule is far more than 'general'. It is fixed. It is long and well established. It enjoys an immutable and universally applicable status comparatively rare among the rules of law. Without it, the entire statutory and regulatory structure governing the drafting,

> submission, examination, allowance, and enforceability of claims would crumble.

D.M.I. v. Deere & Co., 755 F.2d 1570, 1574 (Fed. Cir. 1985).

This fundamental error is present not only with respect to the Federal Circuit's construction of claim 39 of the '410 patent, but it also is present with respect to its construction of claim 22 of the parent '621 parent. The majority holds that the claim 22 of the parent must be interpreted as including the "play" limitation. App. at 19a-20a. It is this interpretation that leads the majority to conclude that "play" must be read into the asserted patents as well. App. at 20a-21a. However, the only difference between claim 1 and claim 22 of the '621 patent is the "play" limitation, which appears in claim 1 and not claim 22. App. at 445a-446a, 450a-451a; App. at 39a-40a (Judge Schall's dissent). By reading the "play" limitation into claim 22, the majority has done precisely what Judge Rich so strongly proscribed in *D.M.I.*

IV. THE FEDERAL CIRCUIT ABROGATES THIS COURT'S CLEAR PRECEDENT THAT PROHIBITS LIMITING METHOD CLAIMS TO USE WITH THE DISCLOSED APPARATUS

The asserted claims of the '907 and the '267 patents are method claims. They are directed to methods of installing mechanically locking flooring panels. App. at 343a-344a, 376a-379a, 387a-388a. The majority limits these claims to use with panels that have "play" in the joint when they are joined together. App. at 15a.

This is the same basic error in claim interpretation that was addressed by this Court in *Smith v. Snow*, 294 U.S. 1 (1935). In that case, the patent pertained to a method of incubating eggs in stages. *Id.* at 5-6. The method as claimed in *Snow* called for arranging the eggs at different levels in a

closed chamber and circulating heated air throughout the chamber in a particular way. *Id.* at 7-8. The specification described certain propellers used to circulate the air and included drawings showing the eggs arranged in tiers on trays. *Id.* at 9-10. The accused infringer sought to avoid infringement by limiting the claims to use with the structures disclosed for arranging the eggs and circulating the air. *Id.* at 8. This Court rejected this argument, noting that what is claimed is the method: "The method is that of Smith. Respondents do not avoid infringement of the method by varying the details of the apparatus by which they make use of it." *Id.* at 20 (emphasis added).

This strong and clear statement by the Supreme Court relating to interpretation of method claims has been ignored by the Federal Circuit in this case. The majority has limited the method claims of the '907 and '267 patents to use with the apparatus disclosed in the specification, which the majority read as panels that have play in the joint when joined together. App. at 13a-15a. That interpretation is directly contrary to *Smith v. Snow*.

V. THE FEDERAL CIRCUIT'S APPROACH TO CLAIM INTERPRETATION PENALIZES THE INVENTOR FOR COMPLYING WITH THE BEST MODE REQUIREMENT OF §112, ¶1, CONTRARY TO PRECEDENT

Section 112, ¶1 requires an inventor to describe in the specification the "best mode" of the inventions claimed in the patent. In ruling on the impact of complying with the predecessor to 35 U.S.C. § 112, ¶1 (the "best mode" requirement), this court said:

> An inventor must describe what he conceives to be the best mode, but he is not confined to that. If this were not so, most patents would be of little worth.

Continental Paper Bag Co., 210 U.S. at 418 (emphasis added).

Several years later, this Court elaborated upon its ruling, stating:

> We may take it that, as the statute requires, the specifications just detailed show a way of using the inventor's method, and that he conceived that particular way described was the best one. But he is not confined to that particular mode of use since the claims of the patent, not its specifications, measure the invention. *Paper Bag Patent Case*, 210 U.S. 405, 419; *McCarty v. Lehigh Valley R. Co.*, 160 U.S. 110, 116; *Winans v. Denmead*, 15 How. 330, 343.

Smith, 294 U.S. at 11.

The Supreme Court in *Smith v. Snow* noted that the patentee included many details in the specification and, in doing so, was being "obedient to the command of the [best mode] statute." *Id.* at 9. The Court went on to rule that the patentee should not be punished for complying with the best mode requirement. *Id.* at 13-14.

In this case, the majority's use of the specification, rather than the claims, to define the invention runs afoul of the requirement of 35 U.S.C. §112, ¶1 and this Court's precedent regarding the best mode requirement, which holds that an inventor is not limited to the best mode described in the specification.

In this case, the inventor testified that he included a description of panels having a small play because he understood that US patent law required him to disclose the best way he knew of carrying out his invention. App. at 492a - 493a. By limiting the claims of the asserted patents in this case, as the majority has done, to the "best mode" the court

effectively punishes the inventor for complying with §112, ¶1.

VI. THE FEDERAL CIRCUIT'S USE OF THE PROSECUTION HISTORY IN CONSTRUING THE CLAIMS IS CONTRARY TO ITS OWN AND THIS COURT'S PRECEDENT.

The majority also relies on the file history to support importing a limitation into claims. App. at 18a-21a. The majority uses the prosecution history to limit the claims despite the absence of any estoppel or any clear disavowal of claim scope by the inventor that would justify limiting the claims.

As with its expansive use of the specification to ascertain the scope of the claims, the majority has inflated the importance of the prosecution history as a tool in determining claim scope, to the further detriment of our claims-based system. In so doing, the majority perpetuates the existing confusion and unpredictability regarding how district courts should use prosecution histories when interpreting patent claims.

In its *Markman* decision, the Federal Circuit described itself as having "broad power to look as a matter of law to the prosecution history of the patent in order to ascertain the true meaning of language used in the patent claims." *Markman*, 52 F.3d at 980 (emphasis added). In support of its claim to having this "broad power," the Federal Circuit relied upon two Supreme Court decisions: *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 224 (1880) and *Singer Mfg. Co. v. Cramer*, 192 U.S. 265, 278-85 (1904).

When read carefully, those cases do not support the broad power assumed by the Federal Circuit. This Court was careful in *Goodyear* to avoid suggesting that the file history "be allowed to enlarge, diminish or vary the language of a

patent afterwards issued." 102 U.S. at 227. Indeed, in *Goodyear*, this Court made only limited use of the prosecution history of the patent to confirm a construction of a claim term, "vulcanite," that was actually in the claim, saying:

> We do not mean to be understood as asserting that any correspondence between the applicant for a patent and the Commissioner of Patents can be allowed to enlarge, diminish, or vary the language of a patent afterwards issued.

Id.

In *Singer*, this Court discussed an archaic form of claiming where the patentee expressly limited the claim to the device "substantially as specified." 192 U.S. at 284. Thus, although this Court limited the patent in *Singer*, the incorporation by reference style of claiming seen in *Singer* is not used in any of the patents in this case.

The cautionary statement in *Goodyear*, that words of a patent claim may not be enlarged, diminished, or varied based on statements made during the prosecution of a patent, has never been overturned or modified by the Supreme Court.

Indeed, a later Supreme Court case, *Westinghouse Electric & Mfg. Co. v. Formica Insulation Co.*, 266 U.S. 342 (1924), is illustrative of the primacy of the claim language over the prosecution history. In *Westinghouse*, the accused infringer sought to limit a claim to a two-step process when the claim did not expressly require two steps. *Id.* at 354-55. Rather than read into the claim a limitation not present, the Circuit Court held the patent invalid, and that ruling was affirmed by the Supreme Court. *Id.* at 342-48, 354-55. *Westinghouse* illustrates that it is more important to uphold the claims based system than to avoid invalidating a patent. In the claims based system, it is not the role of the Courts to re-write claims, as the majority did in this case. Rather, the courts

must take the claims as they find them and must make rulings based on the plain meaning of the claims. If the claims are infringed, a finding of infringement is warranted, and if the claims are so broad as to be anticipated or obvious, then a finding of invalidity is warranted. In either event, the courts are not empowered to change the claims.

The file history, by argument or amendment, can have an estoppel effect on the meaning of claims. The estoppel effect has been limited to cases where: 1) the patentee was narrowing a claim after the claim was rejected by the Patent Office, and 2) where the limiting effect is "indisputable" or "clear and unmistakable disclaimer" or "unequivocal." *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("Where the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender.").

In this case, the majority relied upon two aspects of the prosecution history of the '621 parent patent: 1) remarks about the importance of play in claim 1 of the '621 patent, a claim that expressly calls for play, and 2) remarks following allowance of the claim 1 where the patentee was seeking broader claims that did not have play as a limitation. App. at 18a-21a.

The majority's first basis is not applicable under Supreme Court precedent or Federal Circuit precedent because the comments about play were with reference to a limitation that had an express play limitation, a limitation not in any of the asserted claims. App. at 457a-461a. The majority's second basis is not applicable because: a) the remarks were made with respect to a claim (No. 22 of the '621 patent) that had never been rejected; b) the claim being submitted contained

language different from that of all of the asserted claims; and c) claim 22 is a different category of claim as compared to the claims of the '267 and '907 patent claims (apparatus v. method). *See* part IV, *supra*.

The majority does not find a clear and unambiguous disavowal of claim scope as to the asserted claims. App. at 18a-21a. This telling omission is noted in the dissent. App. at 39a-40a. The majority concludes (albeit erroneously) that there are terms in the asserted claims that are the same limitations as those that were "adopted by the applicant to secure allowance of the '621 patent." App. at 20a. However, claim 22 of the '621 patent was never rejected or amended to secure allowance, and obtaining claims without a play limitation was the expressed intent of the patentee when submitting claim 22. App. at 465a-466a. Language (the play limitation) was deleted from claim 1 to arrive at claim 22, making it is erroneous to conclude that a play limitation was adopted to secure allowance of claim 22.

The dissent in this case explained in detail four reasons why the remarks in the file history of the parent relied upon by the majority do not limit the "children" patents. Those reasons are: 1) the remarks were made when the claims were being broadened, not narrowed, App. at 39a-40a; 2) claims 1 and 22 of the parent cannot have the same scope, because the only difference between them is the play limitation, App. at 39a-40a; 3) the phrase "the play that exists" is language from claim 1 which was being differentiated at the time of submission of claim 22, App. at 40a; and 4) the remarks about claim 22 do not relate to a term "in common" with the asserted claims, App. at 40a.

The majority ignores each of these points. App. at 18a-21a. Unless the dissent's fully explained opposing view is completely meritless, it should establish that the file history

in this case is at least ambiguous and not a clear disavowal of claim scope.

The majority's opinion shows a disregard for the Federal Circuit's own precedent[15] and the precedent of this Court. By ignoring the dissent, the majority also ignored this Court's holding in *Goodyear* that a prosecution history may not be used to "enlarge, diminish or vary the language of a patent." 102 U.S. at 227.

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[15] The two Circuit Judges comprising the majority in this case have been the subject of unusually harsh criticism in the past for refusing to follow Federal Circuit precedent. Judge Giles Rich, in his dissent from a denial for rehearing *en banc* in *Atlantic Thermoplastics Co., Inc. v. Faytex Corp.*, 970 F.2d 834 (Fed. Cir. 1992) (a decision written by a panel comprised of Circuit Judge RADER with Circuit Judges MICHEL and ARCHER) said the following:

> The most egregious act of the Atlantic panel, however, is its defiant disregard, for the first time in this court's nearly ten-year history, of its rule that no precedent can be disregarded or overruled save by an en banc court, on the stated but feeble ground that the authors of the precedential opinion "ruled without reference to the Supreme Court's previous cases involving product claims with process limitations." The Atlantic panel continued:
>
> > A decision that fails to consider Supreme Court precedent does not control if the court [i.e. the Atlantic panel] determines that the prior panel [in the Scripps case] would have reached a different conclusion if it had considered controlling precedent.
>
> This is not only insulting to the Scripps panel (Chief Judge Markey, Judge Newman, and a visiting judge), it is mutiny. It is heresy. It is illegal.

Atlantic Thermoplastics Co. v. Faytex Corp., 974 F.2d 1279, 1281 (Fed. Cir. 1992).

Respectfully, there is simply no justification in Supreme Court precedent or the Federal Circuit's own precedent for the majority's use of the file history to limit the asserted claims in this case.

CONCLUSION

The petition for writ of certiorari should be granted for the foregoing reasons.

Respectfully Submitted,

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APPENDIX A

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

Case No. 02-1222, 02-1291

[Filed Nov. 17, 2003]

ALLOC, INC.,
BERRY FINANCE N.V., and
VALINGE ALUMINIUM, AB,
Appellants,

v.

INTERNATIONAL TRADE COMMISSION,
Appellee,

and

PERGO, INC., and ROYSOL, and
AKZENTA PANEELE + PROFILE GmbH,
and UNILIN DECOR N.V.,
BHK OF AMERICA, and
MEISTER-LEISTEN SCHULTE, GmbH,
Intervenors.

ORDER

A combined petition for panel rehearing and for rehearing en banc having been filed by the APPELLANTS, and a response thereto having been invited by the court and filed by the APPELLEE, and the petition for rehearing having been referred to the panel that heard the appeal, and thereafter the petition for rehearing en banc and response having been referred to the circuit judges who are in regular active service,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for panel rehearing be, and the same hereby is, DENIED and it is further

ORDERED that the petition for rehearing en banc be, and the same hereby is, DENIED.

The mandate of the court will issue on November 24, 2003.

Circuit Judge Gajarsa would rehear the appeal en banc.

APPENDIX B

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

Case No. 02-1222, 02-1291

[Filed Sept. 10, 2003]

ALLOC, INC.,
BERRY FINANCE N.V., and
VALINGE ALUMINIUM, AB,
Appellants,

v.

INTERNATIONAL TRADE COMMISSION,
Appellee,

and

PERGO, INC., and ROYSOL, and
AKZENTA PANEELE + PROFILE GmbH,
and UNILIN DECOR N.V.,
BHK OF AMERICA, and
MEISTER-LEISTEN SCHULTE, GmbH,
Intervenors.

Appeal from United States International
Trade Commission
Inv. No. 337-TA-443

JUDGES: Before MICHEL, RADER, and SCHALL, Circuit Judges. Opinion for the court filed by Circuit Judge RADER. Dissenting opinion filed by Circuit Judge SCHALL.

OPINION

RADER, Circuit Judge.

In its Final Determination on Investigation No. 337-TA-443 under 19 U.S.C. § 1337 (section 337), the United States International Trade Commission (Commission) found no infringement of patent claims covering flooring products and methods of joining flooring products. In the Matter of Certain Flooring Prods., Inv. No. 337-TA-443, Notice of Final Initial Determination (Nov. 2, 2001) (Initial Determination); In the Matter of Certain Flooring Prods., Inv. No. 337-TA-443, Notice of Final Determination (Mar. 22, 2002) (Final Determination). Absent patent infringement, the Commission found no domestic injury under section 337 by the imported flooring products. Because the domestic producers, Alloc, Inc., Berry Finance N.V., and Valinge Aluminum AB (collectively, Alloc), cannot prove infringement of the properly construed claims, this court affirms.

I.

Alloc filed a complaint with the Commission alleging the importation and sale of the accused flooring materials violated section 337. To show a violation of section 1337(a)(1)(B) or section 1337(a)(2), a complainant can prove three elements: (1) the importation of goods into the United States or sales of imported goods within the United States; (2) infringement by those goods or sales of a valid and enforceable United States patent; and (3) an industry in the United States marketing the

patented articles. 19 U.S.C. §§ 1337(a)(1)(B) & 1337(a)(2) (2000).

Alloc owns the rights to U.S. Patent Nos. 5,860,267 (the '267 patent)[1], 6,023,907 (the '907 patent), and 6,182,410 (the '410 patent), which claim systems and methods of joining floor panels. Alloc alleged violation of section 337 by reason of infringement of these patents' claims. The asserted patents share the identical specification and all claim priority from the same Patent Cooperation Treaty (PCT) application, filed April 29, 1994, and a continuation of this PCT application, U.S. Application No. 08/436,224, filed May 17, 1995, now issued U.S. Patent No. 5,706,621.

Alloc asserted that Intervenors Pergo, Inc. (Pergo), Roysol, Akzenta Paneele + Profile, GmbH (Akzenta), Unilin N.V. (Unilin), and Meister-Leisten Schulte, GmbH (Meister) all imported flooring products that infringe claims in the '267, '907, and '410 patents. With the exception of Roysol, the Intervenors admitted importation of the accused flooring products, but denied infringing the asserted patents. By order dated July 10, 2001, the administrative judge made an initial determination, which found that Alloc had shown the existence of a domestic industry marketing the patented products - the third requirement under section 337. The administrative judge convened an evidentiary hearing on patent infringement.

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[1] The '267 patent is a divisional of the '621 patent. The '907 patent is a continuation of the '267 patent, and the '410 patent is a continuation of the '907 patent.

Claim 19 of the '267 patent, claim 1 of the '907 patent, and claim 1 of the '410 patent are representative of the asserted claims from each patent and state (emphases added)[2]:

Claim 19 of the '267 patent

A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising the steps of:

a) placing a new one of the panels adjacent to a long edge of a previously laid first one of the panels in a first row and to a short edge of a previously laid second one of the panels in an adjacent second row, such that the new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position relative to said second panel and such that a long edge of the new panel is provided with a locking groove which is placed upon and in contact with a locking strip at the adjacent long edge of the first panel;

b) subsequently angling down the new one of the panels so as to accommodate a locking element of the strip of the first panel in the locking groove of the new panel, whereby the new panel and the first panel are mechanically

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[2] As will become apparent, the emphasized claim terms relate to an essential feature of the invention: play.

connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked together in a first direction also; and

c) displacing the new one of the panels in its longitudinal direction relative to the first panel towards a final longitudinal position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of the other one of the short edges, whereby the new one of the panels and the second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected short edges.

Claim 1 of the '907 patent

A method of laying and mechanically joining floor panels in parallel rows, wherein relative positions of the panels during the method can be defined as including first and second mutual positions, a first mutual position in which (i) the two panels are held in an angled position relative to each other and (ii) upper portions of adjacent edges of the two panels are in mutual contact, and a second mutual position in which the two panels are (i) located in a common plane, (ii) mechanically locked to each other in a first direction that is at right angles to the common plane, (iii) mechanically locked to each other in a second direction, that is at right angles to said first direction

and to the adjacent joint edges, as a result of a first locking member disposed at one of the adjacent edges being connected to a second locking member disposed at the other one of the adjacent edges, and (iv) being displaceable in relation to each other in the direction of the adjacent joint edges, wherein said method comprises the steps of:

a) bringing a new one of the panels into an intermediary position where (i) a previously laid first one of the panels is located in a first row, (ii) a second one of the panels is located in a second row and is in said first mutual position in relation to the first panel, and (iii) the new panel is located in the second row and is in said second mutual position in relation to the second panel and is in a position relative to the first panel such that a mutual distance is present between the upper portions of the adjacent joint edges of the new panel and the first panel;

b) while maintaining said second mutual position between the new panel and the second panel, displacing the new panel relative to the second panel into said first mutual position in relation to the first panel; and

c) angling the new panel and the second panel together into said second mutual position in relation to the first panel.

Claim 1 of the '410 patent

An edge lock for use in a flooring system having a plurality of floor panels, the edge lock for mechanically and releasably locking together adjacent edges of pairs of adjacent floor panels during assembly of the flooring system and when said adjacent floor panels are laying flat on a subfloor with upper corner portions of said adjacent edges being mutually spaced apart, said edge lock comprising:

locking means for forming a first mechanical connection for locking said adjacent edges to each other in a vertical direction, and for forming a second mechanical connection for locking said adjacent edges to each other in a horizontal direction at right angles to said edges, said locking means including:

(i) a locking groove extending parallel to and spaced from a first one of the adjacent edges of one of the adjacent floor panels and being open at a rear side of said one adjacent floor panel, and

(ii) a flexible and resilient locking strip integrated with another of the adjacent floor panels, said locking strip extending throughout substantially an entire length of an edge of the another adjacent floor panel, said locking strip being provided with a locking element projecting from the locking strip,

said locking means being constructed so as to operate as a one-way snap lock in said horizontal direction during the assembly of said flooring system when

displacing said adjacent edges towards each other by resiliently urging the flexible locking strip downwards until the upper portions of said adjacent edges have been brought into complete engagement with each other and the locking element thereby snaps into the locking groove to prevent drifting apart of said adjacent edges, and

said locking means also being constructed so as to enable said adjacent panels, while they are mechanically connected to each other by said first and second mechanical connections, to be turned in relation to each other about said upper corner portions of their locked-together edges in an angular direction so as to move the locking element out of the locking groove in order to unlock said one-way snap lock.

After considering the specification, prosecution history, and other relevant evidence, the administrative judge construed the claims to require "play" or a space between a locking groove on a first panel and the locking element of a panel adjacent to the first panel. The administrative judge construed the claim terms "locking means," "locking element," and "locking member" in view of 35 U.S.C. § 112, ¶ 6 to have structures requiring play. The administrative judge also construed the claims independently of § 112, ¶ 6 and arrived at essentially the same claim construction. In view of this construction, the administrative judge found no literal infringement by the imported products because he found that their locking systems did not include play. Without infringement, the administrative judge found that Alloc did not meet the domestic injury requirement of section 337. Therefore, the administrative judge absolved the intervenors of any violation of section 337 on November 2, 2001.

Alloc and the Commission's investigative staff filed petitions for review, contending the administrative judge erred in construing the claims. The Commission reviewed portions of the Initial Determination, and then issued a Final Determination, which agreed that all of Alloc's claims required the limitation of play. Alloc timely appealed to this court, and this court has jurisdiction under 28 U.S.C. § 1295(a)(6).

II.

This court reviews legal determinations in section 337 investigations, such as claim construction, without deference. *Checkpoint Sys., Inc. v. United States Int'l Trade Comm'n*, 54 F.3d 756, 760 (Fed. Cir. 1995). This court reviews factual determinations for substantial evidence. 19 U.S.C. § 1337(c) (2000); 5 U.S.C. § 706 (2000). Infringement, whether literal or under the doctrine of equivalents, is a question of fact. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 28, 117 S. Ct. 1040, 137 L. Ed. 2d 146 (1997); *Tanabe Seiyaku Co. v. United States Int'l Trade Comm'n*, 109 F.3d 726, 731 (Fed. Cir. 1997). Thus, an infringement determination will be upheld if supported by substantial evidence of record, which is defined to be "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Enercon GmbH v. Int'l Trade Comm'n*, 151 F.3d 1376, 1381 (Fed. Cir. 1998).

A. Claim Construction

In determining patent infringement, this court first examines the scope and meaning of the asserted patent claims. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998). After all, the claims define the scope of an invention. *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d

1107, 1121 (Fed. Cir. 1985) (en banc). "Claim language generally carries the ordinary meaning of the words in their normal usage in the field of invention" at the time of invention. *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1367 (Fed. Cir. 2003). Thus, to determine claim meaning, a court immerses itself in the specification, the prior art, and other evidence, such as the understanding of skilled artisans at the time of invention, to discern the context and normal usage of the words in the patent claim. *See, e.g., Hoechst Celanese Corp. v. BP Chems., Ltd.*, 78 F.3d 1575, 1579 (Fed. Cir. 1996). Dictionaries and scientific treatises may also help supply the pertinent context and usage for claim construction. *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1201, 1202 (Fed. Cir. 2002); *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1309 (Fed. Cir. 1999). Of course, a court must resist relying on any of these sources in a vacuum because they each influence the understanding of one of skill in the art at the time of invention - the standard for assessing claim meaning. *DeMarini Sports, Inc. v. Worth, Inc.*, 239 F.3d 1314, 1324 (Fed. Cir. 2001). Moreover, the specification or the prosecution history of a patent may alter the meaning of a claim term from its conventional usage. A patent applicant may consistently and clearly use a term in a manner either more or less expansive than its general usage in the relevant art, thereby expanding or limiting the scope of the term in the context of the patent claims. *Middleton, Inc. v. Minn. Mining & Mfg. Co.*, 311 F.3d 1384, 1388 (Fed. Cir. 2002) (explaining that in order to disavow claim scope, a patent applicant must clearly and unambiguously express surrender of subject matter during prosecution); *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1342 (Fed. Cir. 2001).

Turning to the Commission's finding that the claims include a "play" limitation, none of the asserted patent claims recites the term play.[3] Even so, the claims recite floor system features, which are emphasized in the claim language above, in which play is necessarily present. These features, and their associated claim terms, relate to "displacement" and "disassembly."

The '907 specification describes "the invention" under the heading "Technical Problems and Objects of the Invention," as "providing a system for making a joint along adjacent joint edges of two building panels, especially floor panels . . . said system being characterized in that . . . the panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection." '907 patent, col. 3, ll. 59-61; col. 4, ll. 6, 15-19 (emphasis added). Notably, the "objects of the invention are achieved by means of a panel-joining system having the features recited in the appended claims." '907 patent, col. 3, ll. 56-58. The '907 specification repeats this point: "The above and other features and advantages of the invention will appear from the appended claims and the following description of embodiments of the invention." '907 patent, col. 6, ll. 15-17. Thus, the specification teaches that the invention as a whole, not merely a preferred embodiment, provides for play in the positioning of floor panels.

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[3] Because the asserted patents all share the same specification, all references to the '907 patent should be understood as being applicable to the '410 and '267 patents as well.

The specification also teaches that play between components of the locking joint permits displacement, i.e., allows connected panels to slide relative to one another. '907 patent, Figure 1. Thus, the play in the joint enables displacement of floor panels to permit assembly of the panels in accordance with the installation method in Alloc's patents. According to the description of Figure 1, "when the panels 1 and 2 are joined together, they can however occupy such a relative position in the direction D2 that there is a small play DELTA between the locking surface 10 and the locking groove 14. This mechanical connection in the direction D2 allows mutual displacement of the panels 1, 2 in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action." '907 patent, col. 7, ll. 38-45. Thus, displacement, facilitated by play, permits assembly via snap action.

According to the '907 specification, play in the joint also permits "disassembly and reassembly of a floor previously laid without causing damage to the panels." '907 patent, col. 3, ll. 48-50. In addition to minimizing the risk of damage to the panels, the system of the invention "can be assembled and disassembled much faster than in present-day systems, and any damaged or worn-out panels can be replaced by taking up and re-laying parts of the floor." '907 patent, col. 4, ll. 54-57. The patent teaches that the preferred method of disassembly is to rotate the panels at an angle to one another without contact between their components. This method achieves disassembly "even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm." '907 patent, col. 5, ll. 28-29. In addition to a first mechanical connection, the specification states that "the invention" provides for a second mechanical connection wherein "a play exists between the locking groove and a locking surface on the locking element that is facing the

joint edges and is operative in said second mechanical connection." '907 patent, col. 4, ll. 16-19. The second mechanical connection "is so conceived as to allow the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip." '907 patent, col. 4, ll. 23-26. Thus, the second mechanical connection, in which play exists, permits release of the locking element upon turning the groove panel away from the strip projecting from the groove panel, essentially unlocking the snap lock assembly.

The '907 specification further criticizes prior art floor systems without play. '907 patent, col. 3, ll. 1-21. The specification teaches that displacement of prior art panels is a "complicated operation" in systems having panels "tightly urged against each other," meaning displacement is hard to achieve in systems without play. '907 patent, col. 3, ll. 10-12. Furthermore, disassembly and reassembly, which play facilitates, is unfeasible with these prior art systems. As the '907 specification explains, "it is not possible to disassemble a glued floor panel once laid, without having to break up the joints. Floor panels that have been taken up cannot therefore be used again. . . . Nor can damaged or worn-out panels be replaced without extensive efforts." '907 patent, col. 2, ll. 26-32.

Moreover, all the figures and embodiments disclosed in the asserted patents imply play, or, as in the case of Figure 1b, expressly disclose play. Indeed, the patents do not show or suggest any systems without play. Thus, the '907 family of patents describe only flooring systems and methods of joining these flooring systems with play between the locking groove and the locking element.

In so concluding, this court recognizes that it must interpret the claims in light of the specification, *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff'd* 517 U.S. 370, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996), yet avoid impermissibly importing limitations from the specification. *Comark Communications v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998). That balance turns on how the specification characterizes the claimed invention. *Sunrace Roots Enter. Co., LTD v. SRAM Corp.*, 336 F.3d 1298, 1305 (Fed. Cir. 2003). In this respect, this court looks to whether the specification refers to a limitation only as a part of less than all possible embodiments or whether the specification read as a whole suggests that the very character of the invention requires the limitation be a part of every embodiment. For example, it is impermissible to read the one and only disclosed embodiment into a claim without other indicia that the patentee so intended to limit the invention. *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1327 (Fed. Cir. 2002). On the other hand, where the specification makes clear at various points that the claimed invention is narrower than the claim language might imply, it is entirely permissible and proper to limit the claims. *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1345 (Fed. Cir. 2001).

Because the present case is factually similar to *SciMed,* this court's analysis in that case is instructive here. In *SciMed*, the court identified the sole claim construction issue to be "whether the common specification of the three patents limits the scope of the claims to catheters with coaxial lumens." *Id.* at 1340. The patentee argued that the claims should have been construed to include catheters with not only coaxial but also dual or side-by-side lumens. *Id.* But this court disagreed, finding:

> At various points, the common specification of the three patents indicates that the claimed invention uses coaxial, rather than side-by-side lumens, i.e., that the guide wire lumen is contained within the inflation lumen and that the inflation lumen is annular. Read together, these portions of the common specification lead to the inescapable conclusion that the references in the asserted claims to an inflation lumen "separate from" the guide wire lumen must be understood as referring to coaxial lumens, and thus that the asserted claims read only on catheters having coaxial lumens.

Id. at 1342. Here too, the '907 specification read as a whole leads to the inescapable conclusion that the claimed invention must include play in every embodiment.

This court's analysis in *SunRace* is similarly instructive, as the present facts are distinguishable. The parties' dispute centered on whether the claims included a cam as part of a shift actuator. In that case, the court found that the specification as a whole did not mandate that the claimed invention include a particular feature; instead, the court found that the patentee had clearly contemplated a shift actuator without a cam. *SunRace*, 336 F.3d at 1304-5. It stated: "Nothing in the written description indicates that the invention is exclusively directed toward cams or suggests that systems employing cams are outside the scope of the invention. Thus, while it is clear that the patentee was primarily focused on an embodiment of the invention using a cam, nothing in the patent limits the claims to that embodiment." *Id.* at 1305. Here, the '907 specification indicates that the invention is indeed exclusively directed toward flooring products including play. Moreover, unlike the patent-at-issue in *SunRace*, the '907 specification also distinguished the prior art on the basis of play. *Id.*

Although the specification alone is sufficiently clear, the prosecution history of this patent family confirms the description in the specification of each patent, namely, that play is a key feature of the claimed invention. The PCT priority application included claims to a "system for providing a joint along adjacent joint edges . . . of two building panels," the system having panels, when joined together, that "can occupy a relative position in said second direction (D2) where play (DELTA) exists." The International Preliminary Examination Report (IPER) issued in the PCT application states that none of the documents cited in the International Search Report "describe a system where a play exists between the locking groove (14) and the locking element (8), where the connection allows mutual displacement of the panels in the direction of the joint edges and where the connection is so conceived as to allow the locking element to leave the groove (14) if the groove panel (2) is turned about its joint edge angularly away from the strip. The device is therefore novel." Thus, the IPER based its conclusion of novelty on the claim's recitation of play in the system joint.

During prosecution of the U.S. parent '621 patent application, the patentee represented to the United States Patent and Trademark Office (USPTO) that play is "important" because it enables displacement and disassembly of connected panels. Specifically, in response to a prior art rejection under 35 U.S.C. § 102(b), the patentee stated:

> The claimed "play" of the present invention is important for two reasons. One, it enables the panels to slide movably with respect to each other along the direction of the joint edge, which is specifically claimed in the penultimate paragraph of claim 1. This movability allows the short ends of the panels to be placed adjacent each other when installing the floor.

> Second, the play further enables disassembly of the floor when required. . . . Trotter [the prior art] also does not teach or suggest the feature of the present invention that is defined in the last claim of claim 1, i.e., that the second mechanical connection enables the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly way from the strip.

In response, the USPTO examiner allowed the claims over the Trotter reference, noting (emphases added):

> The prior art of record fails to teach the use of adjacent joint floor paneling wherein the floor panels are interconnected by a locking element located within a groove formed on the underside in such a way so as to allow for displacement of the panels in a direction toward the joints and to allow for the locking member to be released from the groove when the panel is rotated about the joint.

Thus, like in the IPER, the USPTO relied on the patentee's statement distinguishing the invention from the prior art based on the invention's ability to displace panels ("slide movably") and to release adjacent panels by rotation about the joint. The applicant persuaded the USPTO that play enables these features. After gaining allowance of these claims, the patentee added new claims nearly identical to those allowed, except without the term play. The applicant did not, however, retract or modify the representations that secured allowance of the original claims. Instead, the applicant acknowledged:

> New independent claim 22 is substantially the same as independent claim 1 except that it does not define the

> play that exists between the locking groove and the locking surface. As such, displacement of the panels is still facilitated in a direction along the joints which is what is believed to be meant by the Examiner's Statement of Reasons for the indication of allowable subject matter. (Emphasis added.)

As such, the applicant represented to the USPTO examiner that play facilitated its novel system set forth in the revised claims. Because the applicant invoked play to overcome the prior art, which lacked displacement and disassembly, Alloc cannot now contend that the '621 patent claims a flooring system and method for installing that system without play. The applicant expressly disavowed systems without play during prosecution of the parent '621 application. *See Middleton*, 311 F.3d at 1388.

Likewise, the independent claims of the '907, '410, and '267 patents incorporate the same limitations adopted by the applicant to secure allowance of the parent '621 patent. *Augustine Med., Inc. v. Gaymar Indus., Inc.*, 181 F.3d 1291, 1300 (Fed. Cir. 1999) (noting that the prosecution history of a parent patent application may limit the scope of a later patent application using the same claim term). The critical features of the parent '621 patent claims are also recited in the claims of its offspring. Each of the asserted patent claims recite locking members, locking elements, or locking means that permit displacement of panels or release of panels during disassembly. Specifically, the asserted '907, '410, and '267 patent claims require the displacement of floor panels, or floor panels that are displaceable in relation to each other.

Moreover, the system claims of the '410 patent require locking means that unlock adjacent floor panels by turning the panels in an angular direction to move the locking element out

of its locking groove. To gain allowance of the parent patent claims over the prior art, the applicant insisted that play enables displacement and disassembly. Moreover, this feature distinguished the claimed flooring system over systems without play. All of the asserted child patents have specifications identical to the parent '621 specification. Thus, the limitations of the parent, as dictated by the specification's disclosure, apply as well to each of its children. Because play facilitates displacement and disassembly, as stated in the parent '621 patent file history, the asserted claims all require that feature.

The parties disagree as to whether this court should construe certain features of claims 1-3 of the '907 patent, claims 1, 26, 41 and 48 of the '410 patent, and claims 19, 23, and 39 of the '267 patent under 35 U.S.C. § 112, ¶ 6 as means-plus-function limitations. Claims 1-3 of the '907 patent recite the terms "first locking member" and "second locking member." The claims of the '410 patent recite the terms "locking means," "locking element," and "means for mechanically locking." The claims of the '267 patent recite the terms "first locking member," "second locking member," and "locking element." 35 U.S.C. § 112, ¶ 6 states:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112, ¶ 6 (2000). While typically considered in light of apparatus claims, § 112, ¶ 6 is also applicable to steps

in a process claim. *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997).

In this case, the outcome does not hinge on whether or not the claims are interpreted under 35 U.S.C. § 112, ¶ 6, as the critical factor, play, applies to claims of either flavor. The applicant emphasized the criticality of play during prosecution of the parent '621 application. This record informs the claims of its children as well. Whether those claims fall under the § 112, ¶ 6 regime or not, the patent applicant tethered the displacement and disassembly features of the claims to the play feature. Alloc cannot now obtain a claim construction under § 112, ¶ 6 disregarding play.

B. Infringement

After construing the claims of the '907, '410, and '267 patents, the Commission compared the claims to the imported floor systems. Because the Commission correctly construed the claims to require play, Alloc relied on its expert, Mr. Limbert, to show play in the imported flooring systems. Nonetheless, the administrative judge found that none of the imported products exhibited play.

With respect to Unilin's system, the administrative judge discounted Mr. Limbert's analysis as flawed due to his reliance on drawings not depicting Unilin's product and faulty mathematical calculations. Initial Determination, slip op. at 90-92. The administrative judge rejected Alloc's arguments regarding play in Pergo's product because Alloc's sole basis for making these arguments was that Pergo's product contained the same joint as Unilin's product. Initial Determination, slip op. at 93. Thus, the reasons for rejecting Alloc's assertions against Unilin are equally applicable to

Pergo. Alloc did not allege that Roysol's products possessed play. Initial Determination, slip op. at 94.

Alloc argued that manufacturing tolerances may result in pretension or play in Akzenta's flooring products. However, the administrative judge rejected this argument, because the design specifications and quality control practices of Akzenta prevent the introduction of play during manufacturing. According to Akzenta's expert, Dr. Blair, physical inspection of Akzenta's product confirmed the absence of play. Initial Determination, slip op. at 97.

Thus, the administrative judge carefully weighed the evidence of record, and found the Intervenor's arguments and expert testimony more persuasive than Alloc's. Based on this evidence, the administrative judge found no literal infringement of Alloc's claims by the imported flooring systems, as each system lacks the requisite play. This court generally defers to an agency as fact-finder in assessing the credibility of witnesses. *See Hambsch v. Dep't of Treas.*, 796 F.2d 430, 436 (Fed. Cir. 1986). Because the record supplies substantial evidence to support the administrative judge's factual findings, this court affirms the determination of no literal infringement. *See Enercon*, 151 F.3d at 1376.

Alloc contended that at least some of the Intervenors induced customers to install their imported flooring systems in manners resulting in infringement of the '907 and '267 patents. For example, Alloc argued that Unilin, Pergo, and Roysol provided installation instructions that require customers to follow the steps of Alloc's claimed methods. Alloc asserts that the Intervenors specifically intended to induce infringement of the '907 and '267 method claims.

Under principles of indirect infringement, "whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b) (2000). However, a patentee must show that an alleged infringer knowingly induced another to commit an infringing act to establish induced infringement under section 271(b). *Manville Sales Corp. v. Paramount Sys., Inc.*, 917 F.2d 544, 553 (Fed. Cir. 1990); *C.R. Bard Inc. v. Advanced Cardiovascular Sys., Inc.*, 911 F.2d 670, 674-75 (Fed. Cir. 1990) ("A person induces infringement under § 271(b) by actively and knowingly aiding and abetting another's direct infringement."). Here, the administrative judge found no evidence that the Intervenors intended to induce others to infringe the asserted patents. More importantly, the administrative judge found no evidence of direct infringement, which is a prerequisite to indirect infringement. *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1318 (Fed. Cir. 2003) ("Because this court upholds the verdict that claim 28 of the '494 patent is not directly infringed, the trial court correctly determined that FPS does not indirectly infringe that claim."); *Met-Coil Sys. Corp. v. Korners Unlimited, Inc.*, 803 F.2d 684, 687 (Fed. Cir. 1986) ("There can be no inducement of infringement without direct infringement by some party."). This court finds no reason to disturb the administrative judge's conclusion on inducement.

Contributory infringement prohibits importation into the United States of a component or apparatus for use in a patented process that "has no use except through practice of the patented method." *C.R. Bard*, 911 F.2d at 674. The statute sets forth contributory infringement in section 271(c):

> Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or

> composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

35 U.S.C. § 271(c) (2000). In this case, the administrative judge found that the imported flooring had substantial noninfringing uses. The record showed that the accused flooring products could be installed by methods not claimed in the '267 and '907 patents. Initial Determination, slip op. at 104-07. For instance, the installation instructions for Unilin's floor product are a noninfringing "snap-snap" method. Alloc's expert, Mr. Wennerth, admitted that Pergo's installation instructions describe a noninfringing method of installing Pergo flooring. Akzenta's published PCT application also discloses noninfringing methods of installing its floor products. After weighing this evidence, the administrative judge found no basis for contributory infringement. Initial Determination, slip op. at 107. The record amply supports the administrative judge's determination of noninfringement, and this court finds no reason to alter the decision of the administrative judge.

C. Validity

The criteria set forth in section 337 require not only proof of patent infringement, but also a showing that the infringed patent is valid and enforceable. 19 U.S.C. § 1337(a)(1)(B)(i) (2000). Akzenta argued that Alloc's '907, '410, and '267 patents would be invalid if construed not to require play. In addition, Roysol argued that Alloc's patents are unenforceable

due to misuse. Initial Determination, slip op. at 118-19. Because the claims were construed to require play, the administrative judge did not reach the issue of invalidity over the cited art. With respect to the misuse allegation, the administrative judge found that Roysol did not meet its burden in establishing the elements of patent misuse by Alloc. *Id.* This court affirms those rulings.

D. Domestic Industry

A requirement of a patent-based section 337 action is that a domestic industry "relating to the articles protected by the patent . . . exist[] or [be] in the process of being established." 19 U.S.C. § 1337(a)(2). To determine whether an industry relates to the protected articles (the "technical prong" of the domestic industry requirement), the Commission examines whether the industry produces articles covered by the asserted claims. The test for satisfying the "technical prong" of the industry requirement is essentially same as that for infringement, i.e., a comparison of domestic products to the asserted claims. *Corning Glass Works v. United States Int'l Trade Comm'n*, 799 F.2d 1559, 1563 (Fed. Cir. 1986).

The administrative judge found that Alloc satisfied the economic prong of domestic industry. Initial Determination, slip op. at 2. However, based on the claim construction of the patents at issue, the administrative judge concluded that Alloc did not practice the patents at issue. The products sold by Alloc in the relevant United States market are not covered by any of the asserted patent claims because Alloc sells flooring systems without play. Initial Determination, slip op. at 110-15.

Alloc does not contend on appeal that its products exhibit play. Instead, Alloc presents arguments that three of its

products marketed in the United States can be installed using a hammer and tapping block, which eliminates play. Thus, Alloc makes no attempt to establish a domestic industry in light of claim construction requiring play. Alloc essentially concedes that it cannot show a domestic industry exists under a claim construction requiring its flooring systems to have play. Therefore, Alloc cannot make out a section 337 violation in the instant case for lack of the domestic injury component of the charge.

CONCLUSION

The Commission properly construed the asserted claims of the '267, '907, and '410 patents. Because that construction precludes Alloc from showing infringement by the Intervenors, no injury to a domestic industry has occurred. Therefore, this court affirms the Commission's final determination.

COSTS

Each party shall bear its own costs.

AFFIRMED

DISSENT

SCHALL, Circuit Judge, dissenting.

The majority affirms the Final Determination of the United States International Trade Commission ("Commission") that the Intervenors do not infringe United States Patent Nos. 5,860,267 (the "'267 patent"), 6,023,907 (the "'907 patent"), and 6,182,410 (the "'410 patent"), which claim systems and methods of joining floorboards and which

are owned by Alloc.[1] The majority concludes that the Commission correctly construed the claims at issue as requiring "play," or space between a locking groove on a first panel and a locking element of a panel adjacent to the first panel. The Commission's determination of non-infringement resulted from that claim construction because none of the Intervenors' accused products exhibit the required play. I respectfully dissent. I do so because I am unable to agree with the majority that play is a limitation of the claims at issue.

The majority arrived at the conclusion that the asserted claims require play by relying on statements made by the patentee in the '907 patent specification.[2] The statements identified in the majority's opinion describe play and criticize prior art flooring systems. The majority concludes that these statements compel it to limit the scope of the claims. It further relies on the prosecution history of a parent patent common to the asserted patents, United States Patent No. 5,706,621 (the "'621 patent"). It does so for confirmation of its decision to restrict the asserted claims.

It is always important to bear in mind controlling claim construction principles. Claim interpretation begins with the intrinsic evidence, i.e., the claims themselves, the written description, and, if in evidence, the prosecution history. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed.

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[1] As the majority has done, in the interest of clarity, I refer to Alloc, Inc., Berry Finance N.V., and Valinge Aluminium, AB, collectively as Alloc.

[2] Again, as the majority has done, I refer only to the '907 patent specification throughout this opinion, except where otherwise indicated. The patent specifications of the '267, '907, and '410 patents are identical.

Cir. 2002). The terms used in a claim bear a "heavy presumption" that they have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art. *Id.* at 1366. An accused infringer may overcome this "heavy presumption" and narrow a claim term's ordinary meaning, but it may not do so by pointing to a preferred embodiment disclosed in the specification or prosecution history. Id. In my view, the majority has allowed the accused infringer to narrow the scope of the claims to a preferred embodiment disclosed in the specification.

I begin with the language of the claims. As the majority points out, the asserted claims do not expressly recite play. On appeal, the Intervenors argue that, despite this omission, the claim terms "displace" and "disassemble" require that the mechanical connections between the floorboards have play.[3] They further argue that the claim terms "locking member," "locking groove," "locking strip," and "locking element" are means-plus-function terms and that the only corresponding structure disclosed in the specification is a flooring system that includes play. I only analyze the disputed claim terms. *Vivid Techs., Inc. v. American Science & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) ("Only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.").

I turn first to the term, "displace," which is recited in claim 1 of the '907 patent in the two following phrases: "the two panels are . . . displaceable in relation to each other in

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[3] While many of the claims require "displacement," most of the asserted claims do not require "disassembly." In fact, only claims 1 and 39 of the '410 patent require that adjacent panels be able to "unlock" or that a locking element be able to "leave" a locking groove. The word "disassemble" does not appear in the claims.

the direction of the adjacent joint edges" and "displacing the new panel relative to the second panel."[4] '907 patent, col. 10, ll. 50 & 65-66. The ordinary meaning of the term "displace" is "to remove from the usual or proper place." Merriam Webster's Collegiate Dictionary 335 (10th ed. 1999); *See Texas Digital Sys., Inc. v. Telegenix Inc.*, 308 F.3d 1193, 1202 (Fed. Cir. 2002) (holding that a court may consult a dictionary, encyclopedia, or treatise to help inform the court of the ordinary meaning of a word). In the patents' context, when one displaces a floorboard, one slides the board relative to an adjacent board. Thus, the ordinary meaning of this term is not restricted to flooring systems that have play.

Regardless, a court may restrict the ordinary meaning of a claim term in one of four ways. *CCS Fitness*, 288 F.3d at 1366. First, a claim term will not receive its ordinary meaning if the patentee acted as his or her own lexicographer and clearly set forth a definition of the disputed term in either the specification or prosecution history. *Id.* at 1366. Second, a claim term also will not receive its ordinary meaning if the term "chosen by the patentee so deprives the claim of clarity" as to require resort to other intrinsic evidence for a definite meaning. *Id.* at 1367. Third, if the patentee phrased a claim term in means-plus-function format, the term will only cover the corresponding structure disclosed in the specification, as well as equivalents thereto. *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880-81 (Fed. Cir. 2000). Finally, and most relevant to this case, a claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee limited the scope of the claims. *Id.* at 882 ("One purpose for examining

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[4] The term "displace" is also employed in claims 19, 23, and 39 of the '267 patent and claims 1, 26, and 39 of the '410 patent. Claim 1 of the '907 patent, however, is representative of these claims.

the specification is to determine if the patentee has limited the scope of the claims."); *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1252 (Fed. Cir. 2000) (stating that the prosecution history may only be used to restrict the claims if it includes a clear and unmistakable exclusion or restriction of the claims).

The Intervenors, on appeal, do not argue that Alloc set forth a definition of the term "displace" in either the specification or the prosecution history requiring us to deviate from the plain meaning of the term. They also do not argue that the term "displace" deprives the claims of clarity requiring resort to other intrinsic evidence for a definite meaning. Additionally, there is no contention that the term "displace" is expressed in means-plus-function language. Rather, the parties dispute whether the patentee limited the meaning of the term through statements made in the specification of the '267, '907, and '410 patents or in the prosecution history of the '621 patent. I remain unconvinced that the intrinsic evidence shows that Alloc limited the scope of the claims.

The majority relies on several statements in the patent specification to limit the claims to systems and methods of joining floorboards that have play. In my view, the majority erroneously imports a play limitation into the claims from the common specification of the three patents at issue. Doing so contravenes our well-established doctrine prohibiting the addition of such limitations. *Comark Communications v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998). As we have noted in the past, there is a very fine line between "examining the specification [ ] to determine if the patentee has limited the scope of the claims," *see Watts*, 232 F.3d at 882, and improperly importing a limitation from a patent specification into a claim, *see Comark*, 156 F.3d at 1186. A

specification may only be used to limit a claim if a patentee has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope. *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). In my view, the specification does not include any expressions of manifest restriction requiring us to limit the claims.

The majority identifies three statements in the specification where play is discussed. The first statement provides, in pertinent part, as follows:

> Thus, the invention provides a system for making a joint along adjacent joint edges of two building panels, especially floor panels, . . . said system being characterized in . . . that the panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection . . . .

'907 patent, col. 3, ll. 59-67 & col. 4, ll. 15-19. This statement does not evince an expression of manifest restriction to systems or methods of joining floorboards that have play, nor is it a clear disavowal of claim scope. The statement does not describe a method of joining floorboards. Rather, it refers to just one embodiment, specifically, a system of floorboards that has play. Therefore, it cannot be used to limit the methods claimed in the '907 and '267 patents. It also cannot be used to limit the systems claimed in the '410 patent because the statement employs the word "can." "Can" and "may" are commonly used by patentees to show that a limitation is permissive. Even if we interpret the word "can"

to mean "are able to," as the administrative judge interpreted it, the statement still is permissive and does not require that play exist between two floorboards.

We have, in the past, relied on statements made in a patent specification to restrict a claim's scope. Such statements have, for example, identified a structure and stated that the structure was employed "for all embodiments of the present invention contemplated and disclosed herein." *Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1343 (Fed. Cir. 2001). The statements, however, have always been clear expressions of manifest exclusion or restriction. We have also found claims to be limited in cases where a patentee described only those embodiments that included a particular feature and expressly distinguished the invention over prior art based on the fact that the prior art lacked the identified feature. *See O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1581 (Fed. Cir. 1997).

In this case, the statement from the '907 patent specification is not a clear expression of manifest restriction that requires all embodiments to have play or that limits the claims to only those systems of floorboards that have play. Neither is this a case, as the majority suggests, where only one embodiment is disclosed and where the patentee criticized prior art because it does not include play. I think the majority's contention that the patentee criticized prior art systems without play is misplaced. The prior art reference, to which the majority refers, Swedish reference SE 450,141, discloses panels that are held together by mechanical clips on the underside of the panels. The '907 patent also discusses prior art systems that use glue to hold adjacent panels together. '907 patent, col. 2. ll. 25-27. The patent criticizes these systems for several reasons, but most importantly because their panels are not displaceable once they have been

assembled and cannot be disassembled without being damaged. *Id.* at col. 3, ll. 1-21. These systems are not displaceable and cannot be disassembled because their panels are mechanically or chemically held together, not merely because there is no space between the locking groove and locking element. The '907 patent does not criticize these prior art systems, which use mechanical clips and glue, for lacking play. The patentee's statements do not evidence an attempt to disclaim systems and methods of joining floorboards that do not have play.

The second statement cited by the majority is as follows:

> In order to permit raking up previously laid, joined floor panels in a simple way, a preferred embodiment of the invention is characterized in that when the groove panel is pressed against the strip panel in the second direction and is turned anglularly [sic] away from the strip, the maximum distance between the axis of rotation of the groove panel and the locking surface of the locking groove closest to the joint edges is such that the locking element can leave the locking groove without contacting the locking surface of the locking groove. Such a disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm. '907 patent, col. 5, ll. 18-29. This statement is made with respect to a preferred embodiment. The preferred embodiment relates to the disassembly of a floorboard system that has play of 0.2mm or more.[5] As noted,

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[5] Even if play is required, as the majority holds, it should be defined for purposes of disassembly as a space of 0.2mm or more between a locking groove on a first panel and a locking element of a panel adjacent to the first panel. With respect to displacement, no

> disassembly is not required by most of the asserted claims, and statements, such as this one, relating to disassembly do not inform our construction of the term "displace."[6]

Since two of the asserted claims require disassembly through unlocking adjacent panels or through a locking element leaving a locking groove, the parties dispute the meaning of disassembly. In my view, it also does not require a play limitation. Although the specification refers to play with respect to disassembly, the reference is in a preferred embodiment that describes how to take up floor panels in a simple way where the locking groove does not contact the locking surface of the locking groove. '907 patent, col. 5, ll. 18-29. The specification also discloses that the panels can be quickly and conveniently disassembled without reference to play. Id. at col. 4, ll. 51-54. The second statement, therefore, does not limit the disputed claim terms.

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limit on the amount of play is disclosed in the specification. As such, play should be defined as a space greater then 0mm that allows displacement. The majority points to no evidence, much less substantial evidence, that supports the Commission's finding of no literal infringement. 5 U.S.C. § 706.

[6] For example, the method recited in claim 1 of the '907 patent does not include disassembly as one of the claimed steps. Only claims 1 and 39 of the '410 patent claim an edge lock and a flooring system that allow disassembly of adjacent panels.

The third statement cited by the majority is as follows:

> When the panels 1 and 2 are joined together, they can however occupy such a relative position in the direction D2 that there is a small play between the locking surface 10 and the locking groove 14. This mechanical connection in the direction D2 allows mutual displacement of the panels 1, 2 in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action.

'907 patent, col. 7, ll. 38-45. This statement should not be considered out of context. It should be read in light of the paragraph before it, which describes in some detail the locking members but does not describe play. Again, this statement uses the permissive "can," which suggests that play is not required. In addition, it uses the word "however," suggesting that the configuration is an alternative to the configuration described in the preceding paragraph. None of these statements utilize expressions of manifest restriction; therefore, they do not restrict the claims.

Finally, I turn to the claim terms "locking member," "locking groove," "locking strip," and "locking element." The Intervenors argue that these are means-plus-function terms because they do not recite sufficient structure to maintain the presumption that they are not 35 U.S.C. § 112, ¶ 6 claim terms. The word "means" is not used with respect to these terms in claims 19, 23, and 39 of the '267 patent or in claims 1 and 2 of the '907 patent, and therefore there is a presumption that section 112, ¶ 6 does not apply.[7]

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[7] Claims 1, 26, and 39 of the '410 patent do use the word "means." *See Personalized Media*, 161 F.3d at 703 (stating that the

Personalized Media Communs., L.L.C. v. ITC, 161 F.3d 696, 703-04 (Fed. Cir. 1998) ("The failure to use the word 'means' creates a presumption that § 112, ¶ 6 does not apply . . ."). The presumption can only be overcome if the Intervenors show that the claimed term "fails to recite sufficiently definite structure or else recites a function without reciting sufficient structure for performing that function." *CCS Fitness*, 288 F.3d at 1369 (internal quotes omitted).

In this case, "to lock" is a function. However, a "lock" is a structure that took its name from its function. *Personalized Media*, 161 F.3d at 703 ("Many devices take their names from the functions they perform. The examples are innumerable, such as 'filter,' 'brake,' 'clamp,' 'screwdriver,' or 'lock.'"). The term "member," as Alloc contends, means "a constituent part of a whole." Merriam Webster's Collegiate Dictionary 724 (10th ed. 1999). It is well known

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word "means" in a patent claim triggers a presumption that the element is expressed as a means-plus-function limitation). Claim 1 is representative and recites the function as (1) "forming a first mechanical connection for locking said adjacent edges to each other in a vertical direction" and (2) "forming a second mechanical connection for locking said adjacent edges to each other in a horizontal direction at right angles to said edges." '410 patent, col. 10, ll. 42-46. The structure disclosed in the specification that corresponds to this function is the tongue and groove to form the first mechanical connection for locking the edges in the vertical direction and the locking strip and locking groove to form the second mechanical connection for locking the edges in a horizontal direction. *Id.* at col. 1, ll. 36-37. *See B. Braun Medical v. Abbott Lab.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997) ("Structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim."). These structures, as discussed below, do not require play.

in the mechanical arts that a lock typically has several parts that interconnect. Therefore, a locking member refers to a part of a lock and recites structure rather than function. The same is true for the terms "locking groove," "locking strip," and "locking element." As such, these terms maintain their ordinary meanings and do not require play.

The majority also relies on the prosecution history of the '621 patent application to support its conclusion that the '907 patent specification limits the asserted claims. I do not think, however, that the prosecution history evidences a clear and unmistakable exclusion or restriction of the claims, as required by our precedent. *Bayer*, 212 F.3d at 1252. Specifically, the majority relies on statements made by the inventor during prosecution of the '621 patent distinguishing the claims over a prior art reference called Trotter. The '621 patent claims that were pending at the time the statements were made (claims 1-20) included an express limitation of play. Therefore, the statement by the patentee that "Trotter also does not teach or suggest a system wherein two panels, when joined together, occupy a relative position where a play exists" is an accurate statement and does not relate to claims that do not include the same element. Statements such as these made during the prosecution of a parent application can only apply to continuation applications if the parent and child patents contain the same claim limitations. *Biovail Corp. Int'l v. Andrx Pharms., Inc.*, 239 F.3d 1297, 1301 (Fed. Cir. 2001) ("When multiple patents derive from the same initial application, the prosecution history regarding a claim limitation in any patent that has issued applies with equal force to subsequently issued patents that contain the same claim limitation."); *see Desper Prods. v. Qsound Lab.*, 157 F.3d 1325, 1339 n.6 (Fed. Cir. 1998) (holding that this rule also applies to divisional applications). These particular statements, however, cannot apply to the '907, '267, or '410

patent claims because they do not share the express play limitation that was in claim 1 of the '621 patent at the time the statements were made. *Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc.*, 265 F.3d 1294, 1306-07 (Fed. Cir. 2001) ("Medtronic provides no plausible reason why the prosecution histories of either the '273 or '548 patents are relevant to the construction of claim 3 of the '233 patent. Notably, there are no common claim terms in dispute. Indeed, the present case involves the absence of a claim term.").

After the Examiner of the '621 patent application issued a Notice of Allowance, the inventor realized that he could remove the play limitation and his claims would still be novel over the prior art. This led him to add claims 21-23 to the '621 patent application. These claims excluded the limitation of play. The response to the Examiner's Office Action stated with respect to claim 22:

> New independent claim 22 is substantially the same as independent claim 1 except that it does not define the play that exists between the locking groove and the locking surface. As such, displacement of the panels is still facilitated in a direction along the joints which is what is believed to be meant by the Examiner's Statement of Reasons for the indication of allowable subject matter. Accordingly, claim 22 is also patentable over the cited prior art.

These statements do not represent a clear and unmistakable disclaimer or restriction to systems that have play. To the contrary, they suggest that claim 22 does not require play. In fact, the doctrine of claim differentiation suggests that two claims that are identical except for one element presumptively differ in scope. *Kraft Foods, Inc. v. Int'l Trading Co.*, 203 F.3d 1362, 1368 (Fed. Cir. 2000) (stating that claim

differentiation creates a presumption that each claim in a patent has a different scope). In this case, claim 1 and claim 22 are identical except that claim 22 excludes the play limitation. This suggests that they do in fact differ in scope. Moreover, the phrase, "play that exists," which concerns the majority, merely mirrors the language in claim 1 of the '621 patent and does not indicate that play in fact exists as an element of claim 22.

Even if these last statements do place a limit on claim 22, this limitation would not apply to the '907, '267, or '410 patent claims because they do not share a common term that has been limited. Instead, the patentee effectively imported a limitation into claim 22 through the prosecution history. *Advanced Cardiovascular*, 265 F.3d at 1306-07. The same limitation is not necessarily imported into to the subsequent claims in a related patent.

In light of this claim construction, I would vacate the Final Determination of the Commission that the Intervenors do not infringe the '267, '907, and '410 patents. In addition, I would remand the case to the Commission for further proceedings regarding infringement, validity, and domestic industry. Since the majority rejects this claim construction, I do not address those issues. To do so would be a mere academic exercise.

For the foregoing reasons, I respectfully dissent.

APPENDIX C

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

Inv. No. 337-TA-443

In the Matter of	)
	)
CERTAIN FLOORING PRODUCTS	)
	)

COMMISSION OPINION ON THE ISSUES UNDER REVIEW

INTRODUCTION

Except as indicated herein, the Commission adopts the administrative law judge's ("ALJ") final initial determination ("ID").[1] Specifically, the Commission adopts the ID with respect to its findings that there is no violation of section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337, in this investigation because respondents do not infringe (a) claims 1 or 26 of U.S. Letters Patent 6,182,410 ("the '410 patent"),

[1] Any factual findings of the ALJ that support this opinion are hereby adopted and any factual findings that are inconsistent with this opinion are rejected.

(b) claims 1, 2, or 3 of U.S. Letters Patent 6,023,907 ("the '907 patent"), or claims 19, 23, or 39 of U.S. Letters Patent 5,860,267 ("the '267 patent"). The Commission also adopts the ID's finding that complainants do not practice the asserted claims of the '267, '410, and '907 patents and consequently they do not meet the domestic industry requirement of section 337(a)(3),[2] and the ID's finding that the asserted claims are not invalid.[3] Finally, the Commission also makes additional findings regarding the corresponding structures in the specification needed to perform the functions of claims 1 and 26 of the '410 patent, claim 1 of the '907 patent, and claims 19, 23, and 39 of the '267 patent, when these claims are construed under 35 U.S.C.§ 112, ¶6 ("§ 112, ¶6 ").

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[2] The domestic industry requirement is traditionally viewed as having two "prongs:" the economic prong and the technical prong. Complainants must show that an industry exists, the economic prong, and that they practice at least one claim of the patents at issue, the technical prong. *Certain Variable Wind Turbines and Components Thereof,* Inv. No. 337-TA-376, Commission Opinion (Sept. 23, 1996). The ALJ and the Commission previously found that complainants have satisfied the economic prong, ALJ Order No. 26 (July 19, 2001) (Unreviewed ID). However, the ALJ found that complainants did not satisfy the technical prong of the domestic industry requirement because they do not practice the patents in controversy. The Commission also finds, based on its construction of the asserted claims, that complainants do not practice those patents.

[3] Respondents contend that the claims in controversy are invalid only if they are construed as not requiring play *(see, e.g.,* Akzenta's Rey. Br. at 20-30); thus, since the Commission has determined that the claims in issue do require play, respondents' arguments are not applicable and the patents are not invalid based on the arguments presented to the Commission.

The Commission also finds that respondents' accused products do not infringe claims 1, 26, and 39 of the '410 patent, if those claims are not construed under § 112, ¶16, but does not adopt the ID with respect to certain functions identified for those claims. The Commission also does not adopt the ID's finding regarding the function of the "means for locking" limitation of claim 39 (and dependent claims 41 and 48) of the '410 patent when construed under § 112, ¶6, but finds that claim 39 has different limitations that are not infringed. The Commission finds that complainants abandoned the argument that respondents infringe the asserted claims of the patents in issue under the doctrine of equivalents or under § 112, ¶6 equivalents. The Commission also finds that, were we to consider equivalents under § 112, ¶6, we would find that respondents do not infringe any of the claims of the patents at issue

I. PROCEDURAL HISTORY

This investigation was instituted on January 5, 2001, based on a complaint filed by Alloc, Inc., Racine, Wisconsin; Berry Finance N.V., Oostrozebeke, Belgium AB; and Välinge Aluminum, Viken, Sweden (collectively "complainants"). 66 *Fed. Reg.* 1155 (Jan. 5, 2000). The complaint alleged a violation of section 337 in the importation and sale of certain flooring products by reason of the infringement of claims of the '267 patent and claims of the '907 patent. The complaint named seven respondents: (1) Unilin Decor N.V., Wielsbeke, Belgium; (2) BHK of America, Inc., Central Valley, NY; (3) Meister-Leisten Schulte GmbH, Ruthen, Germany (collectively "Unilin"); (4) Pergo, Inc., Raleigh, NC ("Pergo"); (5) Akzenta Paneele+Profile, Kaisersecsch, Germany, ("Akzenta"); (6) Tarkett, Inc. ("Tarkett"),

Whitehall, PA;[4] and (7) Roysol, Saint-Florentin, France ("Roysol").

On March 5, 2001, the ALJ issued an ID (ALJ Order No. 8) granting complainants' motion to amend the complaint to add allegations of infringement of claims of the '410 patent.

An evidentiary hearing was held from July 26, 2001 through August 1, 2001, and closing arguments were heard on October 16, 2001. The ALJ issued his final ID on November 2, 2001, concluding that there was no violation of section 337 because (1) complainants have not established that any of the asserted claims of the '267, '410, and '907 patents are infringed by any of respondents' accused products; (2) respondents have failed to establish that the asserted claims are not valid; and (3) no domestic industry exists that exploits any of the patents in controversy.

Petitions for review of the ID were filed by complainants and the Commission investigative attorney ("IA"). Respondents Akzenta, Pergo, Roysol, and Unilin, and complainants filed responses to the petitions for review. On December 20, 2001, the Commission determined to review:

> (1) the ID' s construction of the asserted claims of the '410 patent, both under § 112, ¶6 and apart from that statute;

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[4] Tarkett was subsequently terminated from the investigation on the basis of a consent order. Order No. 31 (Oct. 25, 2001) (Unreviewed ID).

(2) the ID's construction of the asserted claims of the '267 and '907 patents, except not to review the ID's construction of those claims apart from § 112, ¶6;

(3) the ID's infringement conclusions with respect to the '267, '410, and '907 patents, except not to review the ID's conclusions that (a) the asserted claims of the '267 and '907 patents are not infringed when those claims are construed apart from § 112, ¶6, and (b) complainants have not established that there are no substantial non-infringing uses for the accused products and hence there is no contributory patent infringement;

(4) the ID's validity conclusions with respect to the '267, '410, and '907 patents, except not to review the ID's validity conclusions when the asserted claims of the '267 and '907 patents are construed apart from § 112, ¶6; and

(5) the ID's conclusions with respect to the technical prong of the domestic industry requirement with respect to the '410, '267, and '907 patents, except not to review the ID's conclusions that complainants have failed to establish the technical prong of the domestic industry requirement when the asserted claims of the '267 and '907 patents are construed apart from § 112, ¶6. 66 *Fed. Reg.* 67302, 67303 (Dec. 28, 2001).

The Commission raised specific questions concerning the above issues and also sought briefing on the question of whether complainants waived the issue of whether the accused products infringe the asserted claims of the patents in controversy to the extent that the asserted claims are construed under §112, ¶6 to cover equivalents of the structure

disclosed in the specification, *viz.*, the equivalents of a mechanical joint with play, by failing to raise the issue before the ALJ.

II. THE PATENTS AT ISSUE

Two of the patents at issue, the '267 patent and the '907 patent, are method patents that concern methods for the laying and mechanically joining together of building panels, especially floor panels. The third patent, the '410 patent, concerns a system, *i.e.*, an apparatus, for mechanically locking together adjacent floor panels. The asserted claims of the '410 patent are directed to an edge lock (claims 1 and 26) and to a flooring system (claims 39, 41, and 48). All three patents have essentially the same specification, which is based on a Patent Cooperation Treaty application. ID at 4.

III. NO VIOLATION OF SECTION 337

A. Claims 1 and 26 of the '410 Patent

We adopt the ID's construction of claims 1 and 26 of the '410 patent under § 112, ¶6, but also make additional findings regarding the structures corresponding to the claimed functions. Specifically, claim 1 of the '410 patent recites a "locking means" that has the function of (a) "forming a first mechanical connection for locking said adjacent edges to each other in a vertical direction," (b) "forming a second mechanical connection for locking said adjacent edges to each other in a horizontal direction at right angles to said edges," (c) "operat[ing] as a one-way snap lock in said horizontal direction," and (d) "enabl[ing] said adjacent panels," when connected by the first and second connections, to be rotated "so as to move the locking element out of the locking groove

in order to unlock said one-way snap lock." '410 patent at column 10, line 42-column 11, line 8.

As stated above, we adopt the ID's finding that, if construed under § 112, ¶6, claim 1 of the '410 patent provides no structure concerning how the panels are connected such that they can be turned to allow for the rotation needed to disengage the locking element from the locking groove (the disassembly function).[5] ID at 56-58. However, although the ID found that "play" is an essential element of the corresponding structure, it did not explicitly identify all of the corresponding structures in the specification.[6] ID at 63. We find that the corresponding structure to the claimed function of the locking means to be rotated in relation to each other to unlock the snap lock ('410 patent at column 11, lines 1-8) is also found in the specification of the '410 patent at column 9, lines 4-12, which states:

> [T]he locking surface 10 is so located relative to the joint edge 3 that when the groove panel 2, starting from the joined position in FIG. 2c, is pressed

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[5] Because claims 1 and 26 use the term "locking means," the rebuttable presumption is that the locking means limitation is a means-plus-function limitation. *Greenberg v. Ethicon Endo-Surgery*, 91 F.3d 1580, 1584 (Fed. Cir. 1996). This presumption has not been overcome because the claims do not provide sufficient structure to perform the entire function. *Rodine PLC v. Seagate Tech Corp.*, 174 F.3d 1294, 1304 (Fed. Cir. 1999).

[6] *Kemco Sales, Inc. v. Control Papers Co., Inc.*, 208 F.3d 1352, 1361 (Fed. Cir. 2000) (a means-plus-function limitation must be construed to determine what the claimed function is and what structure is disclosed in the specification that corresponds to the means for performing that function.)

> horizontally in the direction D2 against the strip panel 1 and is turned angularly up from the strip 6, the maximum distance between the axis of rotation A of the groove panel 2 and the locking surface 10 of the locking groove is such that the locking element 8 can leave the locking groove 14 without coming into contact with it.

The corresponding structure requires play. We note that the ID cites to this section of the specification (ID at 27 and 61) and find that it identifies said structure implicitly, if not explicitly.

As with claim 1, claim 26 uses the term "locking means" and does not provide sufficient structure to perform the entire claimed disassembly function; claim 26 does not recite how the locking groove and locking strip permit the locking panels to be released. ID at 58-59. As with claim 1, the ID does not explicitly identify all of the structures corresponding to the claimed function in claim 26 of the '410 patent. We find that the corresponding structures for the "releasably locking" limitation are recited in the specification at column 9, lines 4-12, which recites play.[7] Similarly, as discussed below, the

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[7] The Commission finds it appropriate to use the phrase "releasably locking" from the preamble to claim 26 in interpreting claim 26 because doing so is "necessary to give life, meaning and vitality" to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1995). Moreover, the preamble refers to the edge lock for mechanically and *releasably locking together adjacent first edges* of pairs of flooring panels...." ('410 patent at column 12, lines 67 to column 13, lines 8-9) (emphasis added) and the body of claim 26 refers to "locking said adjacent first edges" throughout the claim. Thus, the preamble statement regarding "releasably locking" the adjacent first edges "is intimately meshed with the ensuing language in the claim." *Pitney*

prosecution history of the '410 patent shows that play is part of the locking grove and locking element that perform the claimed disassembly function. ID at 42-45.[8]

Finally, the ID also states that, regardless of whether claims 1 and 26 of the '410 patent are construed under § 112, ¶6, they contain the limitation of play because play "enabl[es] specific objects of the invention directed to displacement." ID at 88. However, we find that the mutual displacement of joined panels along the joint edge is not a requirement of claim 1 or claim 26. Nevertheless, as discussed in our analysis of the claims under § 112, ¶6, those claims contain a "releasably locking" limitation and, as stated above, the specification and prosecution history of the '410 patent show that the claimed disassembly function requires play between the claimed locking grove and locking element. Thus, we adopt the ID's finding that because respondents' accused products lack play, they do not infringe claims 1 or 26 of the '410 patent.

B. Claim 39 (and Dependent Claims 41 and 48) of the '410 Patent

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Bowes, Inc., 182 F.3d at 1306.

[8] The Federal Circuit has held that "whether § 112, ¶6 is invoked involves an analysis of the patent and the prosecution history...." *Personalized Media v. U.S. Intern. Trade Com'n*, 161 F.3d. 696, 704 (Fed. Cir. 1998). Moreover, the prosecution history shows that play is an unclaimed element of the corresponding structure needed to perform the disassembly and displacement functions. The support for invoking § 112, ¶6 is found in the prosecution history, which is also broadly applicable to the other asserted claims and to interpreting these claims.

We disagree with the ID's construction of claim 39 and dependent claims 41 and 48 of the '410 patent in three respects. First, the ID identified the "means for locking" in claim 39 as including "lock[ing] the panels together in the horizontal and vertical directions." ID at 60-61. The relevant limitation reads:

> said floor panels being provided with means for mechanically locking together their long edges as well as their short edges in a first direction at right angles to a principal plane of the panels, thereby forming first mechanical connections between the panels . . . . ('410 patent at column 14, lines 17-21).

Thus, the above limitation refers only to mechanically locking in the first direction, *viz.*, the vertical direction.

The ID also identifies the function of the "means for locking" in claim 39 as including "allow[ing] the panels to rotate relative to one another, so that at some point during this rotation the locking element will disengage from locking." ID at 60-61. However, claim 39 identifies the "rotate and unlock" function with the second, not the first, mechanical connection. '410 patent at column 14, lines 42-46.[9]

Finally, the ID concludes that "allow[ing] mutual displacement of the panels in the direction of the long edges" is a function of the "locking means." ID at 61. The "mutual displacement" limitation, *i.e.*, "the first and the second mechanical connections are so constructed as to allow mutual

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[9] The second mechanical connection "lock[s] the panels to each other in a *second* direction parallel to the principal plane...." (emphasis added). '410 patent at column 14, lines 33-34.

displacement of the panels in the direction of the long edges," does not, however, recite the term "locking means." '410 patent at column 14, lines 39-41.

Nevertheless, we find that play is a limitation of the structures for performing the functions of mutual displacement and disassembly recited in the two claimed functions of (1) mutual displacement function, and (2) rotate/disassembly function, which are recited in two "so constructed as to allow" means-plus-function limitations. '410 patent at column 14, lines 39-41 (mutual displacement) and '410 patent at column 14, lines 42-46 (rotate/disassembly function).[10] Claim 39 does not provide sufficient structure to show how these functions are to be performed. The Commission finds the corresponding structure to the claimed function of rotation/unlocking is disclosed in the specification of the '410 patent at column 7, lines 38-45, which states:

> When the panels 1 and 2 are joined together, they can however occupy such a relative position in the direction D2 that there is a small play Δ between the locking surface 10 and the locking groove 14. This mechanical connection in the direction D2 allows mutual displacement of the panels 1, 2 in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action.

See also '410 patent at column 9, lines 4-12; ID at 42-44. The corresponding structure for the mutual displacement function

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[10] This case is analogous to *Raytheon v. Roper,* 724 F.3d 951, 957 (Fed. Cir. 1983), wherein it was held that a functional claim recital introduced by the phrase "so that" was a means-plus-function recital.

is shown at column 7, lines 38-45 of the '410 patent's specification.

We also find that, even were we not to construe these claims under § 112, ¶6, they contain a play limitation in the mutual displacement and disassembly elements based on an examination of the claims, the specification, and, as discussed below, the prosecution history. *Vitronics Corp. v. Conceptronic Inc.*, 90 F.3d, 1576, 1582 (Fed. Cir. 1996).

Based on the above claim construction, we find that respondents do not infringe claim 39 (or dependent claims 41 and 48) of the '410 patent because, as the ID found, respondents' accused products do not have play. ID at 89-99.

C. Claim 1 (and Dependent Claims 2 and 3) of the '907 Patent and Claims 19, 23, and 39 of the '267 Patent

We adopt the ID's construction of claim 1 (and dependent claims 2 and 3) of the '907 patent under § 112, ¶6, but also make additional findings regarding the structures corresponding to the claimed functions. Specifically, claim 1 of the '907 patent contains the limitation that "the two panels are... mechanically locked to each other in a second direction that is at right angles.... to the adjacent joint edges, and the limitation that the two panels are "displaceable in relation to each other in the direction of the adjacent joint edges...." '907 patent at column 10, lines 39-51. The critical claimed functions in claim 1 are that the two panels are "(iii) mechanically locked to each other in a second direction, that is at right angles to said first direction and to the adjacent joint edges, as a result of a first locking member disposed at one of the adjacent edges being connected to a second locking member disposed at the other one of the adjacent edges, and

(iv) being displaceable in relation to each other in the direction of the adjacent joint edges...." '907 patent at column 10, lines 44-51.

We adopt the ID's finding that, if construed under § 112, ¶6, claim 1 of the '907 patent provides no structure corresponding to the means for performing the displacement function recited in the claim. However, although the ID finds that play is an essential element of the corresponding structure, it does not explicitly identify all of the corresponding structures in the specification. We find that, in addition to the disclosed play, the corresponding structures necessary to perform the claimed function are recited in the specification of the '907 patent at column 7, lines 38-45, which portion of the specification is cited in the ID, but not explicitly identified as corresponding structure. (ID at 25). We adopt the ID's finding that, because respondents' accused products do not have play, they do not infringe claim 1 of the '907 patent.

Likewise, claims 19, 23, and 39 of the '267 patent do not provide sufficient structure to perform the displacement function recited in those claims. The specification of the '267 patent shows that the corresponding structure to the claimed mutual displacement function in claims 19, 23, and 39 of the '267 patent is a mechanical connection in the direction D2 where there is a small play between the locking surface 10 and the locking groove 14. '267 patent at column 7, lines 38-45. We adopt the ID's finding that, because respondents' accused products do not have play, they do not infringe claims 19, 23, and 39 of the '267 patent. ID at 89-99.

D. Complainants' Equivalents Arguments

The Commission finds that complainants have waived their right to have the Commission consider infringement under the judicial doctrine of equivalents or infringement on the basis of § 112, ¶6 equivalents. First, as to the doctrine of equivalents, complainants did not raise the doctrine of equivalents in their petition for review as an issue for which they sought review, and they have thus waived the issue pursuant to rule 210.43(b)(2), 19 C.F.R. § 210.43(b)(2).[11] In their petition for review, the only equivalency issues identified by complainants were those concerning § 112, ¶6 equivalents.

Second, as to § 112, ¶6 equivalents, complainants sought Commission review of whether the ALJ erred by not considering § 112, ¶6 equivalents for the purpose of determining whether respondents' accused products, and/or instructions, or the methods used by the purchaser of respondents' products, meet the limitations of the asserted claims. The Commission finds that complainants failed to raise the issue of § 112, ¶6 equivalents in a timely fashion before the ALJ by (a) not identifying the issue with particularity in their pre-hearing brief, in accordance with the ALJ's Ground Rules,[12] (b) not having any witness testify on

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[11] Commission rule 210.430(b)(2) provides that any issues not raised in a petition for review are "deemed to have been abandoned by the petitioning party and may be disregarded by the Commission in reviewing the initial determination ...."

[12] ALJ Ground Rule 9(d) provides that pre-hearing statements "shall include a statement of issues to be considered at the hearing that sets forth with particularity a party's contentions on each of the proposed issues, including citations to legal authorities in support thereof. Any contention not set forth in detail as required herein shall be deemed abandoned or withdrawn . . . ." ALJ Order No. 1 to which the Ground Rules are attached. *Cf.* MANUAL FOR

whether respondents' products (and/or instructions) and methods are § 112, ¶6 equivalents of the asserted claims, and (c) not otherwise supporting a § 112, ¶6 equivalents infringement case.[13]

In any event, had complainants timely raised arguments regarding § 112, ¶6 equivalents, we find that the outcome of this investigation would not change. *See Hazani v. U.S. Intern. Trade Com'n*, 126 F.3d 1473, 1476-79 (Fed. Cir. 1997). Implicit throughout the ID is the finding that play is so central to all the claims at issue that there could be no §112, ¶6 equivalent to any of the claims that did not have play. The

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COMPLEX LITIGATION (THIRD) § 21.641 at 122 (1995), which provides for an analogous procedure when pre-hearing statements are required, and requires that a party list in its pre-hearing statement the facts it intends to establish at trial and the supporting evidence and that "[n]o evidence not included in the statement would be permitted at trial."

[13] Complainants argued during closing argument, but only with respect to the '410 patent, that if the ALJ were to find that §112, ¶6 applied, he should find that respondents' products have the "same or equivalent structure" and are thus infringing. However, this brief statement made no factual argument as to why respondents' products allegedly have an "equivalent" structure. Tr. at 2272-73. Complainants made no mention of § 112, ¶6 in their Post-Hearing Statement (corrected copy Sept. 4, 2001), but did briefly mention it in their Post-Hearing Rebuttal Statement at 95-96 (Sept. 7, 2001), where they argued without citation to the record or citation to legal authority, that "[t]here is no substantial difference in the methods used by Respondents and those claimed in the '907 and, regardless of whether the subject panel joints are found to have 'play.' This demonstrates equivalents both under the doctrine of equivalents and also under Section 112, Par. 6." No mention was made of the asserted claims of the '410 patent and no factual support was proffered.

ID found that, even under a §112, ¶6 claim construction, the accused products did not infringe because they lacked play. Implicit in the ID is the notion that an equivalent cannot be interpreted so broadly as to effectively eliminate from these claims the essential element of play and that the accused products, even were they to be construed as equivalents, would still lack play and could not infringe. The ID found for all the claims in issue that:

> [P]lay is an implicit limitation provided in the written description, which is part of the definition of the claim terms such as "locking element," "locking member," "locking strip," and "locking groove" set forth in the specification. Those elements exhibit play when in the locked position, as shown and described throughout the written description of the three patents at issue. ID at 87.

In the ID's view, play is described in both the specification and the prosecution history of the claims at issue as "critical to the practice of the invention." ID at 88. An equivalent without play, therefore, would clearly eliminate an essential claim element in its entirety.

During prosecution of the application that resulted in the patents in controversy, the inventor distinguished a prior art reference by indicating that, unlike the prior art, his invention had play, which enabled mutual displacement of panels and disassembly of the panels. ID at 42-43. Moreover, after he amended his claims to overcome a rejection by the PTO examiner, the inventor indicated in remarks to the examiner that the new independent claim was substantially the same as the prior claim, "except that it does not define the play that exists between the locking groove and the locking surface." ID at 44. During prosecution of the patents, the applicant also

disavowed flooring panel structures without play because of their inability to achieve the desired result of the invention -- mutual displacement and disassembly. The applicant pointed out to the PTO examiner that the prior art was incapable of mutual displacement and disassembly "because it specifically prevents the claimed play." ID at 43. Of particular concern to the applicant was that the prior art acted to "hold the boards closely together so as to prevent play from occurring between the two boards." ID at 43. In other words, the prior art, like respondents' accused products, had pretension, *i.e.*, they "hold the boards closely together." Thus, the applicant disavowed flooring panels that lacked play during prosecution, arguing that such flooring panels were incapable of achieving the objects of the claimed invention.

It is inconsistent for the patentee to argue before the PTO examiner that the claimed flooring products with play are patentable over flooring products without play, and then to argue to the Commission that flooring products without play are equivalent to flooring products with play. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1457 (Fed. Cir. 1998), *quoting Alpex Computer Corp. v. Nintendo Co.*, 102 F.3d 1214, 1221 (Fed. Cir. 1996) ("just as prosecution history estoppel may act to estop an equivalence argument under the doctrine of equivalents, positions taken before the PTO may bar an inconsistent position on claim construction under § 112, ¶6."). *Ballard Medical Prods. v. Allegiance Healthcare Corp.*, 268 F.3d 1352, 1359 (Fed. Cir. 2001), *citing Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1357 (Fed. Cir. 1999) ("[s]tatements detailing the shortcoming of the relevant prior art have often proved useful in construing means-plus-function claims"). Having disavowed flooring panels without play, complainants cannot now assert that such flooring panels are the equivalents of flooring panels with

play. *See J&M Corp. v. Harley-Davidson*, 269 F.3d 1360, 1367 (Fed. Cir. 2001).

In sum, complainants are estopped from seeking to apply § 112, ¶6 equivalents to respondents' accused products that do not have play in view of the applicant's disavowal during prosecution of prior art structures without play and his statements that flooring products without play are incapable of achieving the objects of his invention. Indeed, it has been held that even under the judicial doctrine of equivalents, where equivalence may be interpreted more broadly than under § 112, ¶6, that the doctrine of equivalents "is not allowed such broad play as to eliminate [an] element in its entirety." *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997).

Moreover, as discussed below, there are substantial differences between the claimed invention and each of the respondents' accused products. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.*, 145 F.3d 1303, 1309 (Fed. Cir. 1998) (the test for showing under § 112, ¶6 that the accused product is equivalent is "whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial.")

1. Complainants' Equivalents Arguments Concerning Unilin's Accused Products

Complainants argue that, because the amount of pretension, or negative play, in respondent Unilin's products is so small, 0.017 mm (citing Tr. at 1963-64), and the amount of play stated in the specification is "less than 0.2 mm," the pretension is subsumed by the manufacturing tolerances for Unilin's products. Complainants' Rev. Br., Tab 2 at 15-16. First, as to the alleged amount of pretension, this measurement was made from a series of computer-aided drawings that Dr. Boe, respondent Pergo's expert, made from a tooling diagram.[14] The ID found that the actual dimensions of the accused Unilin product differ from the tooling diagram and that it was inappropriate to use the tooling diagram as a basis for analyzing play. ID at 89-91. We agree.

Second, as to complainants' argument that the amount of play in the asserted claims is 0.2 mm (Complainants' Rev.

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[14] Complainants mischaracterize Dr. Boe's testimony as indicating that the amount of negative play in the accused Unilin product "has no reality to the world, the real world" (Tr. at 1966-67), and that "the amount of negative play is nil." Tr. at 1966. Complainants argue that this testimony means that the negative play in the accused Unilin product "has no meaningful effect on the working properties of the panels." Complainants' Rev. Br., Tab 2 at 15. Dr. Boe testified that his calculation lacked reality because the computer drawings he had made was "an attempt to explain what I mean by negative play [and] has nothing to do with actual dimension[s]." Tr. at 1975. Given that the calculation is based on the tooling drawings that the ID found were inaccurate for the purpose of measuring play and the nature of Dr. Boe's testimony, we find that Dr. Boe's testimony is not a sufficient basis for proving complainants' contention.

Br., Tab 2 at 15), this figure refers to the specification of the patents in controversy, which states that "disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm." '410 patent at column 5, lines 28-30. Thus, the specification does not state the amount of play is 0.2 mm; it merely states that disassembly can occur even if the amount of play is as little as 0.2 mm. Thus, 0.2 mm should not be used as the measure of play in the patents in controversy, as the passage in the specification makes clear that the amount of play can be larger than 0.2 mm, which appears to be the minimum amount of play necessary for disassembly and certainly not the maximum amount of play.

Third, complainants contend that the manufacturing tolerances for the accused Unilin product

It thus appears that the actual dimensions of the Unilin product are dependent on all of the above variables and not just on the manufacturing tolerances.

In any event, the statistics used by complainants regarding (a) the amount of Unilin's pretension and (b) the amount of play in the invention in making their "subsuming" argument -- that the negative play in the Unilin product is so small as to be subsumed by the manufacturing tolerances for the Unilin product -- are not accurate statistics for comparing the amount of pretension in Unilin's accused product and the amount of play in the patented claims in controversy.

Moreover, Pergo's expert made actual measurements of randomly-selected Pergo products (which are essentially identical to the Unilin products, ID at 93) and none of those

products showed play. Tr. at 1903-1918. In addition, as the ID found, respondent Unilin's expert tested samples of Unilin's accused products and determined that they did not have play. ID at 92-93.

Complainants argue that there are open spaces in the Unilin joint that are known to be interchangeable with play and with other design factors that allow displacement of the panels. Complainants cite testimony from Dr. Loferski, Unilin's expert, for the proposition that incorporating open spaces into a joint so as to reduce the amount of surface area and friction is an alternative to play. Tr. at 1590-92. In fact, a review of the cited testimony shows that Dr. Loferski stated only that, if the amount of contact in the surface areas in the joint is reduced, that would reduce somewhat the amount of friction and make displacement easier, and that the Unilin joint is capable of displacement "[i]f you push it hard enough." That testimony cannot properly be characterized as indicating that open spaces in the Unilin joint are an alternative to play. Tr. at 1592.

Complainants contend that the high density fiberboard ("HDF") used in Unilin's accused product makes it readily slideable, which is the equivalent of a profile with play. Complainants' Rev. Br., Tab 2 at 18. Complainants reach this conclusion based on a citation to Dr. Loferski's testimony where he answered "Perhaps, yes" to the following question: "So there's going to be some material that's going to make displacement possible or easy as opposed to other materials that's going to make it difficult or maybe impossible; right?" Tr. at 1589. Complainants also argue that Mr. Theirs testified that Unilin's accused product follows U.S. Letter Patent 6,006,486, whose specification indicates that HDF or mutual density fiberboard ("MDF") can be "shifted readily alongside each other in interlocked condition, even when engaged with

a tensioning force." RX-138, column 3, lines 48-53; Tr. at 1497-98. In fact, Mr. Theirs testified that the displacement can occur "when you use a hammer and a block." Tr. at 1498. We find that this testimony is not a sufficient basis for showing that the use of HDF or MDF is equivalent to play.

Complainants argue that the Unilin accused product uses wax, a "sliding agent," which creates play or the equivalent to play.[15] Complainants' Rev. Br., Tab 2 at 19-21. There is, however, unrebutted testimony that the amount of force needed to move flooring panels with wax is approximately 2.5 times greater than the amount of force needed to move flooring panels without wax. Tr. at 1094, CX-124. In any event, we agree with the IA that, to the extent wax makes mutual displacement and/or disassembly possible, wax constitutes a different *way* of accomplishing the result sought than a structure with play. IA's Rev. Br. at 12-13. Thus, complainants have not shown that the use of wax is the equivalent of play.

Complainants argue that the Unilin product includes a small play (0.007-0.14 mm) between the locking element and locking strips, according to a measurement made by complainants' expert. Complainants' Rev. Br, Tab 2 at 21. This argument is based on an analysis of Unilin's 8.0 mm panels and a review of Unilin drawings, CX-1583. Complainants assert that the Unilin drawings "are not just a

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[15] Complainants also argue that the use of wax falls within the scope of the claimed function because the specification mentions the use of wax at column 9, lines 40-54. The ID found that portion of the specification unclear because it refers to a "recess 26," which is not depicted in the patent drawings. ID at 30. We agree. Thus, complainants' contention that the use of wax falls within the scope of the function has not been established.

representation for tooling purposes... but the dimensions on those drawings are really what make up the measurement that are done on the product after it's produced." Tr. at 2054-2055.

The Commission finds this argument unpersuasive because the ID found that the tooling drawings are used to make the tools that are used to make the Unilin product, ID at 90, and that the actual dimensions of the Unilin product differ from the drawings for four reasons, including the facts that the positioning of the tools in the cutting machine is subject to adjustment and that the MDF used in making the product is a wood-based product that reacts to being cut by springing back. ID at 90. Moreover, the ID found that Dr. Limbert's analysis was flawed because, among other reasons, it contained basic errors in algebra. ID at 92. Consequently, the Commission finds that complainants have not shown that the Unilin product has play or the equivalent of play.

2. Complainants' Equivalents Arguments Concerning Akzenta's Accused Products

Complainants argue that the Akzenta panels have play or the equivalent of play under § 112, ¶6 because, while the Akzenta panel is designed for a theoretical exact fit, the tolerances of the Akzenta product are such that "there is no substantial difference for purposed [sic] of equivalents under § 112, ¶6 between panels with a tiny amount of play and panels with a theoretical exact fit." Complainants' Rev. Br., Tab 2 at 31. Complainants argue that the manufacturing tolerances of Akzenta's products are such that at least some of the products will have a clearance between the tongue and the locking groove. *Id.* at 32.

The design specification for Akzenta's products calls for a "line-to line" design, *i.e.*, an exact fit between the tongue and groove portions of adjoining panels with no space between them. ID at 94-95. Accordingly, as the ALJ found, the locking elements used in the Akzenta product are designed to be exactly the same size as the locking grooves. ID at 95. Complainants, however, argue that because Akzenta has a manufacturing tolerance of plus or minus 0.03 mm (ID at 95), some of Akzenta's products will have play. This argument has two flaws. First, complainants refer to the "tiny amount of play that is described in the patent specification" Complainants Rev. Br., Tab 2 at 31. The only reference in the patent specification to the amount of play is the statement that "disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm." '410 patent at column 5, lines 28-30. Thus, the specification does not specify the maximum amount of play that can exist for disassembly to occur and complainants lack a basis for making the assumption that the amount of play is 0.2 mm.

Second, the record shows that the actual tolerances of the machines used to make the Akzenta products are much better than the tolerance standard. ID at 96. Most important, Akzenta's expert found a lack of play in his observation of multiple samples of the Akzenta panels. ID at 96-97 The ID found that complainants failed to produce even one test finding play in any Akzenta panel. ID at 97-99. The Commission thus finds that complainants have not proven that Akzenta's panels have play or the equivalent of play.

3. Roysol's Accused Products

Complainants did not argue that Roysol's accused products have play or the equivalent of play. Complainants'

Rev. Br. at 31-37. The ID found that complainants "did not raise any arguments or cite to any evidence showing that the accused Roysol products had play." ID at 94. Consequently, the Commission finds that complainants have not shown that Roysol's accused products have play or the equivalent of play.

4. Complainants' Other Equivalents Arguments Are Unavailing as They Do Not Show Insubstantial Differences

Complainants argue that factors other than play can be used in flooring panels, such as the frictional characteristics of the material, the amount of interference, how well-machined the edges are, whether there has been any surface treatment of the material, and the geometry of the joint.[16]

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[16] With respect to complainants' argument that "the geometry of a joint, such as the extent of the places where panels contact each other, is interchangeable with play" (Complainants' Reply Br. at 18) complainants rely on testimony by their expert. Dr. Limbert answered a question as to the effect on a flooring panel if play were removed from it by stating that removing play "could increase the frictional forces that are occurring at the joint and the amount of that interference and the elastic properties of the materials and the joint geometry, and several other things I'm probably forgetting about, that will determine how much interference we have, how much normal forces are generated as a result of that interference, and then how much additional frictional forces could occur." Tr. at 891. We find that Dr. Limbert's testimony does not support the assertion that "geometry of a joint, such as the extent of the places where the panels contact each other, is interchangeable with play." Complainants' Reply Rev. Br. at 18. Complainants' other arguments are simply variations on those that are discussed above or in the ID, and as discussed therein, they are not supported by the record.

Complainants' Reply Br. at pp. 18, 35, and 51.

The Commission finds that respondents' accused products, which lack play, do not accomplish the mutual displacement and disassembly functions in substantially the same *way* as do the corresponding structures disclosed in the patent specification. The corresponding structure disclosed in the specification accomplishes the claimed mutual displacement and disassembly functions with play, *i.e.*, a gap between the locking surface and the locking groove. In contrast, respondents' accused products, which have contact between the locking surface and the locking groove, accomplish the mutual displacement and disassembly functions by reducing friction in other ways. The Commission finds that complainants have not shown that the ways used in respondents' accused products, which lack play, accomplish the displacement and disassembly functions in substantially the same as the way used in the corresponding structure disclosed in the specification.[17]

Indeed, the antithesis of a claim limitation cannot be an equivalent of that limitation. *See Moore U.S.A., Inc. v. Standard Register Co.*, 229 F.3d 1091, 1106 (Fed. Cir. 2000) (finding that where the claim was for strips of adhesive that would extend the *majority* of the lengths of said longitudinal marginal portions, an accused product would not be construed under the doctrine of equivalents to cover strips that extend only a *minority* of the length) (emphasis added). The Federal Circuit has stated that "it would defy logic to conclude that a

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[17] The Commission also notes that complainants have failed to meet their burden under § 112, ¶6 of showing that the alleged equivalent structures to the ones disclosed in the specification were available at the time of the issuance of the patents in issue. *A1-Site Corp. v. VSI Int'l*, 174 F.3d 1308, 1320 (Fed. Cir. 1999).

minority -- the very antithesis of a majority -- could be insubstantially different from a claim limitation requiring a majority. . . ." *Accord*, *Scimed Life Systems, Inc. v. Advanced Cardiovascular Systems, Inc.*, 242 F.3d 1337, 1345-46 (Fed. Cir. 2001) (finding that the patentee, having disclaimed the dual lumen structure and having stated it was inferior to the claimed coaxial lumen configuration, would not be permitted to apply the doctrine of equivalents to dual lumen structures). Similarly, respondents' accused products, which lack play, cannot constitute equivalents to the claimed limitations, which require play.

IV. CONCLUSION

The Commission affirms the ID regarding its findings that section 337 of the Tariff Act of 1930 has not been violated because respondents' accused products do not infringe the asserted claims of the '410 patent, the '907 patent, or the '267 patent. However, the Commission modifies the ID with respect to claims 1 (and dependent claims 2 and 3) and claims 26 and 39 of the '410 patent, and finds non-infringement on a different basis from the ID both under § 112, ¶6 and apart from § 112, ¶6. In addition, the Commission finds that complainants do not meet the domestic industry requirement of section 337(a)(3) and that the asserted claims are not invalid on the basis of the arguments presented to the Commission.

IN THE MATTER OF CERTAIN FLOORING PRODUCTS

337-TA-443

PUBLIC CERTIFICATE OF SERVICE

I Marilyn R. Abbott, hereby certify that the attached **COMMISSION OPINION ON THE ISSUES UNDER REVIEW**, was served upon the following parties via first class mail and air mall where necessary on April 23, 2002.

/s/_____

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APPENDIX D

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

Investigation No. 337-TA-443

In the Matter of	)
	)
CERTAIN FLOORING PRODUCTS	)
	)
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Final Initial Determination

This is the administrative law judge's final initial determination, under Commission rule 210.42. The administrative law judge, after a review of the record developed, finds no violation by any respondent of section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337).

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ABBREVIATIONS

CFF	Complainants' Proposed Findings
CPost	Complainants' Posthearing Brief
CRe	Complainants' Reply Brief
CRRFF	Complainants Rebuttal Finding To Roysol
FF	Findings Of Fact
RAPost	Posthearing Brief Of Repondents Akzenta Paneele + Profile GmbH And Tarkett, Inc. (Akzenta)
AFF	Akzenta's Proposed Findings
ARe	Reply Brief Of Akzenta
RMPost	Posthearing Brief by Respondent Meister-Leisten Schulte GmbH (Meister-Leisten)
MRe	Reply Brief Of Meister-Leisten
RPPost	Posthearing Brief of Respondent Pergo, Inc. (Pergo)
PFF	Pergo's Proposed Findings
PRe	Reply Brief Of Pergo
RFF	Roysol's Proposed Findings
RRPost	Posthearing Brief Of Respondent Roysol

RRe	Reply Brief Of Roysol
RUPost	Posthearing Brief Of Respondents Unlin Décor, And BHK of America, Inc. (Unlin)

OPINION

I. Procedural History

By notice, which issued on December 29, 2000, the Commission instituted an investigation, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation into the United States, or the sale within the United States after importation of certain flooring products by reason of infringement of claims 1-3, 5, 6, 8-12, 14, 15, 17-36, 38-40 or 41 of U.S. Letters Patent 5,860,267 (the '267 patent) and claims 1-13 or 14 of U.S. Letters Patent 6,023,907 (the '907 patent) and whether there exists an industry in the United States as required by subsection (a)(2) of section 337. The notice of investigation was published in the Federal Register on January 5, 2001 (66 Fed. Reg. No. 4 at 1155-56).

Complainants identified in the Commission notice were Alloc, Inc. (Alloc), Berry Finance N.V. (Berry) and Välinge Aluminum AG. (Välinge). As respondents, the following were named in the notice: Unilin Décor N.V., BHK of America, Inc., and Meister-Leisten Schulte GmbA (collectively Unilin), Akzenta Paneele + Profile GmbH (Akzenta) and Tarkett, Inc. (Tarkett) and Roysol.

Order No. 5, which issued on January 25, 2001, set a target date of February 5, 2002. Order No. 8 was an initial determination granting complainants' Motion No. 443-6 to amend the complaint and the notice of investigation to add allegations of infringement of claims 1, 8, 13, 14, 21, 26, 27, 34, 39, 40, 41 and 48 of U.S. Patent No. 6,182,410 (the '410

patent). (Motion Docket No. 443-6).[1] The Commission determined not to review Order No. 8 on March 21.

Order No. 26, which issued on July 10, 2001, was an initial determination which found that complainants had satisfied the economic prong of the domestic industry requirement under Section 337. The Commission determined not to review Order No. 26 on July 30, 2001.

Complainants, on August 22, 2001, moved to strike the opening testimony of Unilin's expert, Joseph Loferski. (Motion Docket No. 443-76). On August 22 respondents jointly moved to strike certain testimony of complainants' expert, Douglas Limbert. (Motion Docket No. 443-75). On August 22, respondent Roysol moved to strike certain testimony and exhibits and to move into evidence limited deposition testimony of W. Jack Lewicki. (Motion Docket No. 443-74). On August 22, respondent Akzenta moved to strike certain of complainants' exhibits. (Motion Docket No. 443-73). On August 28, respondent Roysol moved to amend its motion to strike which was filed on August 22. (Motion Docket No. 443-77). Those motions are dealt with in Order No. 32, which issued on November 2.

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[1] Complainants, at the hearing in late July, 2001, asserted only claims 19, 23 and 39 of the '267 patent, claims 1, 2 and 3 of the '907 patent and claims 1, 26, 39, 41 and 48 of the '410 patent. (Tr. at 678-681,774). Order No. 30, which issued on October 19, 2001, was an initial determination granting complainants' unopposed motion to terminate the investigation with respect to claims 1-3, 5-6, 8-12, 14-15, 17-18, 20-22, 24-36, 38 and 40-41 of the '267 patent, claims 4-14 of the '907 patent and claims 8, 13-14, 21, 27, 34 and 40 of the '410 patent.

On October 19, 2001, pursuant to Commission rule 210.21, complainants and respondents Tarkett and Akzenta jointly moved to terminate the investigation as to Tarkett. (Motion Docket No. 443-84). Order No. 31, which issued on October 25, was an initial determination granting said motion.

On July 26, 2001, the hearing commenced and continued on July 27, 28, 30, 31 and August 1. Post hearing submissions have been made. In addition, closing arguments were heard on October 16. The matter is now ready for decision.

This final initial determination is based on the record compiled at the hearing and the exhibits admitted into evidence.[2] The administrative law judge has also taken into account his observation of the witnesses who appeared before him during the hearing. Proposed findings submitted by the parties not herein adopted, in the form submitted or in substance, are rejected as either not supported by the evidence or as involving an immaterial matter and/or as irrelevant. The findings of fact included herein have references to supporting evidence in the record. Such references are intended to serve as guides to the testimony and exhibits supporting the findings of fact. They do not necessarily represent complete summaries of the evidence supporting said findings.

II. Parties

See FF 1 to 75.

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[2] Complainants, on August 7, 2001, moved for leave to file their revised final hearing exhibit lists. (Motion Docket No. 443-70). Motion No. 443-70 is granted.

III. Importation

Respondents, with the exception of Roysol, admitted to importation (Tr. at 2221). See also FF 15. Respondent Roysol took no position on importation and argued that, while it did not suggest complainants have not met their burden, complainants have the burden of proving importation. The administrative law judge finds that complainants have met their burden. See FF 78, 79, 80, 81.

IV. Patented Subject Matter In Issue

In issue are (1) claims 1, 2 and 3 of the '907 patent, (2) claims 1, 26, 39, 41 and 48 of the '410 patent and (3) claims 19, 23 and 39 of the '267 patent. All three of the patents in issue (CX-3, CX-4 and CX-5) are based on essentially the same specification,[3] which is based on a PCT application filed on April 29, 1994 in the name of Tony Pervan (PCT/SE94/00386) (RX 348), now abandoned. The patents in issue claim priority to a Swedish patent application filed in Sweden on May 10, 1993 (RX 184). The three patents in issue have the same parent application, Serial Application No. 08/436,224, which was filed on May 17, 1995, and is now U.S. Pat. No. 5,706,621 (the '621 patent). The '621 patent (CX-1) is currently before the U.S. Patent & Trademark Office (PTO) in reissue and reexamination proceedings. (RX-366).

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[3] There are differences in the specification for each of the three patents in issue that affect column and line citations. Compare col. 1, lines 1-10 of each of the patents in issue. Also the abstracts of said three patents differ, as do "Related U.S. Application Data," "Foreign Application Priority Data," "Field of Search" and "References Cited."

The '907 patent issued on February 15, 2000 on Application Serial No. 09/193,687 filed November 18, 1998, which is a continuation of Application Serial No. 09/003,499 filed January 6, 1998, which issued on January 19, 1999 as U.S. Pat. No. 5,860,267 (the '267 patent).[4] U.S. Pat. No. 6,162,410 (the '410 patent) issued on February 6, 2001 on Serial No. 09/356,563 filed July 19, 1999, which is a continuation of Serial No. 09/193,687. The face of the '410 patent states that the '410 patent is subject to a terminal disclaimer based on the '621 patent. (FF 97).

As the titles of the '267 and '907 patents state, those patents are directed to methods for joining building boards, as are the claims in issue of those patents. (CX-3, CX-4). The title of the '410 patent indicates that that patent is directed to a system for joining building boards. Each of independent claims 1 and 26 of the '410 patent is directed to an edge lock. Independent claim 39 is directed to a flooring system. (CX-5).

V. Claim Construction

Claim construction is a question of law. Markman v. Westview Instruments, Inc., 52 F.3d 967, 978, 34 U.S.P.Q.2d 1321, 1328 (Fed. Cir. 1988). The construction of the language of a claim should be made independently of what is being alleged to infringe the claim. See Donald S. Chisum, Chisum on Patents § 18.03 (2000).

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[4] Serial No. 09/003,499 is a divisional of Serial No.08/436,224, which issued as the '621 patent.

Proper claim construction requires that

> the intrinsic evidence of record [be considered first], i.e., the patent itself, including the claims, the specification and if in evidence the prosecution history. Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.

Vitronics Corp. v. Conecptronic Inc., 90 F.3d 1576, 1582, 39 U.S.P.Q.2d 1573, 1576 (Fed. Cir. 1996). To construe the claims of a patent, "a court principally consults the evidence intrinsic to the patent, including the claims, the written description, and the relevant prosecution history." Watts v. XL Sys. Inc., 232 F.3d 877, 882 (Fed. Cir. 2000). Words in a claim are generally given their ordinary and customary meaning. That the claim terms will be given their ordinary meaning is a "heavy presumption" to be overcome. Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985,988, 989, 50 U.S.P.Q.2d 1607, 1610 (Fed. Cir. 1999); In re Hiniker Co., 150 F.3d 1362, 1369 (Fed. Cir. 1998). The scope of a patent is defined by the claims, and not by the description of the preferred embodiment in the drawings and in the specification. Gart v. Logitech, Inc., 254 F.3d 1334, 59 U.S.P.Q.2d 1290, 1296 (Fed. Cir. 2001). For claim construction purposes, the written description may act as a sort of dictionary, which explains the invention and defines terms used in the claims. A patentee however is free to be his own lexicographer, although any special definition given to a word must be clearly defined in the specification. Markman, 52 F.3d at 978, 979, 34 U.S.P.Q.2d at 1328, 1329, Vitronics, 90 F.3d at 1580.

When construing the claims, a court must look first to the words of the claims, both asserted and unasserted, to define

the scope of the patented invention. Vitronics, 90 F.3d at 1582, 39 U.S.P.Q.2d at 1576. However, the claims are always to be construed in light of the specification of which they are a part. Markman, 52 F.3d at 979, 34 U.S.P.Q.2d at 1329; Slimfold Mfg. Co. v. Kinkead Indus., 810 F.2d 1113, 1116, 1 U.S.P.Q.2d 1563, 1566 (Fed. Cir. 1987). Words defined in the specification must be given the same meaning when they are used in the claims. In fact, a patentee is bound by the specification in interpreting his patent claims when his specification requires a narrower interpretation of the claims than the patentee desires. See Fonar Corp. v. Johnson & Johnson, 821 F.2d 627, 3 U.S.P.Q.2d 1109 (Fed. Cir. 1987). However, a claim must recite a term that is in dispute or in need of a definition before the written description may be used to provide a definition. Renishaw v. Marposs Societa' Per Azioni, 158 F.3d 1243, 1248 (Fed. Cir. 1998). Specifically, limitations that appear in the specification should not be read into the claims, absent an invitation to do so by the language of the claims. Vanguard Prod. Corp. v. Parker Hannifin Corp., 234 F.3d 1370, 57 U.S.P.Q.2d 1087 (Fed. Cir. 2000); Intervet Am., Inc. v. Kee-Vet Lab., Inc., 887 F.2d 1050, 1053 (Fed. Cir. 1989). Also, in construing claims, review of the prosecution history is necessary to determine if the patentee has defined certain disputed terms or provided arguments as to the meaning of claim terms. Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1578, 34 U.S.P.Q.2d 1673, 1678 (Fed. Cir. 1995).

The administrative law judge may, in his discretion, receive extrinsic evidence to aid him in coming to a correct conclusion as to the true meaning of language employed in a patent. Markman, 52 F.3d at 981, 34 U.S.P.Q.2d at 1331. Extrinsic evidence consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries and learned treatises. This evidence

may be helpful to explain scientific principles, the meaning of technical terms and terms of art that appear in the patent and prosecution history. It may also demonstrate the state of the prior art at the time of the invention. Extrinsic evidence, however, is not for the purpose of clarifying ambiguities in claim terminology. Markman, 52 F.3d at 980, 34 U.S.P.Q.2d at 1331. Moreover, neither the patentee nor the alleged infringer may utilize extrinsic evidence to vary or contradict the terms of the claims. Id. at 981, 34 U.S.P.Q.2d at 1331. Thus

> where the public record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. The claims, specification, and file history, rather than extrinsic evidence, constitute the public record of the patentee's claim, a record on which the public is entitled to rely.

Vitronics, 90 F.3d at 1583, 39 U.S.P.Q.2d at 1577. The testimony of an inventor on the proper construction of claims, based on the text of the patent, is entitled to no deference because it amounts to no more than legal opinion as to the process of construction that the administrative law judge must undertake. No inquiry as to the subjective intent of the inventor or of the Patent Office is appropriate or even possible in the context of a patent infringement action. In fact, commonly the claims are drafted by the inventor's patent solicitor, and they may even be drafted by the patent examiner in an examiner's amendment subject to the approval of the inventor's solicitor. Markman, 52 F.3d at 985, 34 U.S.P.Q.2d at 1335.

Only the disputed claim elements Need to be interpreted by the administrative law judge. See In the Matter Certain Hardware Logic Emulation Systems and Components

Thereof, Inv. No. 337-TA-383, (July 31, 1997) (Hardware Logic); and In the Matter of Certain Ion Trap Mass Spectrometers and Components Thereof, Inv. 337-TA-393 at p. 24-25 (February 25, 1998).[5]

A. The '907 Patent

Claims 1, 2 and 3 of the '907 patent, which are in issue, read:

> 1. A method of laying and mechanically joining floor panels in parallel rows, wherein relative positions of the panels during the method can be defined as including first and second mutual positions, a first mutual position in which (i) the two panels are held in an angled position relative to each other and (ii) upper portions of adjacent edges of the two panels are in mutual contact, and a second mutual position in which the two panels are (i) located in a common plane, (ii) mechanically locked to each other in a first direction that is at right angles to the common plane, (iii) mechanically locked to each other in a second direction, that is at right angles to said first direction and to the adjacent joint edges, as a result of a first

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[5] This course of action has been sanctioned by the Court of Appeals for the Federal Circuit, which, when referring to Hardware Logic, stated that "by agreement, the appeal turns on the proper construction of certain disputed terms in the three asserted claims. The operation and structure of the accused device are neither uncertain nor disputed. In sum we adopt the claim construction of the Commission which was correct and derived according to our case law on appropriate methodology." Mentor Graphics Co. v. United States Intl' Trade Comm, 124 F.3d 226 (Fed. Cir. 1997).

locking member disposed at one of the adjacent edges being connected to a second locking member disposed at the other one of the adjacent edges, and (iv) being displaceable in relation to each other in the direction of the adjacent joint edges, wherein said method comprises the steps of:

(a) bringing a new one of the panels into an intermediary position where (i) a previously laid first one of the panels is located in a first row, (ii) a second one of the panels is located in a second row and is in said first mutual position in relation to the first panel, and (iii) the new panel is located in the second row and is in said second mutual position in relation to the second panel and is in a position relative to the first panel such that a mutual distance is present between the upper portions of the adjacent joint edges of the new panel and the first panel;

(b) while maintaining said second mutual position between the new panel and the second panel, displacing the new panel relative to the second panel into said first mutual position in relation to the first panel; and

(e) angling the new panel and the second panel together into said second mutual position in relation to the first panel.

2. The method according to claim 1, wherein the first locking member is a locking groove and the second locking member is a locking element which is received in the locking groove.

> 3 The method according to claim 1, wherein said step of bringing the new panel into the intermediary position comprises the step of bringing the new panel and the second panel into said first mutual position in relation to each other and then angling the new panel into said second mutual position in relation to the second panel.

(Emphasis added). Asserted independent claim 1 of the '907 patent describes a method for "laying and mechanically joining floor panels in parallel rows" where a new panel is brought into "an intermediary position" where (1) a previously laid panel is in the first row (first panel) and (2) a previously laid panel is in the second row (second panel) (3) and the second panel is in an angled position relative to the first panel, (4) so that the upper portions of the adjacent edges of the first and second panels are in mutual contact, (5) the new panel is located in the second row and (6) is in a common plane with the second panel, (7) with which the new panel is locked to by a locking member located on each of the panels' adjacent edges in both the horizontal direction perpendicular to the joint edge and vertical direction, (8) but so that the new and second panels are displacable along their joint edge in relation to each other, and (9) so that there is a space between the upper portions of the adjacent edges of the first and new panels. While remaining (1) in a common plane with the second panel (2) and locked to the second panel in both the vertical direction and the horizontal direction perpendicular to the joint edges, (3) the new panel is then displaced towards the first panel so that it (4) is in an angled position relative to the first panel. The new panel and second panel are then angled downward together so that they are (1) in a common plane, (2) mechanically locked to the first panel by a locking member located on each of the panels' adjacent edges in both the vertical direction and horizontal direction perpendicular to

the joint edge on the second panel, and (3) displaceable with respect to the first panel.

Claim 2 discloses the same method as is disclosed in claim 1, except it specifies that one of the locking members used to lock the panels together is a "locking groove", whereas the other locking member is a "locking element" that is received into the groove.

Claim 3 is identical to claim 1 except that the step of bringing the new panel into intermediary position comprises the steps of bringing the new panel in a position so that it is (1) in an angled position relative to the second panel, and (2) so that the upper portions of the adjacent edges are in mutual contact, and then angling the new panel so that it comes (3) into a common plane with the second panel, and becomes (4) mechanically locked to the second panel by a locking member located on each of the panels' adjacent edges in both the vertical direction and horizontal directions perpendicular to joint edge, such that (5) the two panels are displaceable with respect to each other along the joint edge.

As seen from the emphasized portion, supra, of independent claim 1, said claim, with respect to a "second mutual position," includes steps calling for the panels to be displaceable relative to one another along the joined edge when they are mechanically locked together. It was for this reason, that the Examiner found allowable subject matter in the claimed subject matter in issue. Thus, the Examiner stated (FF 96):

> 3. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the method for laying and mechanically joining parallel rows of rectangular

> building panels: wherein when the panels are interlocked, they are mechanically locked in a first direction that is at right angle to the plane of the panels, they are mechanically locked in a second direction that is at a right angle to the adjacent joint edges and to the first mechanically locked direction, such that when the panels are interlocked they can still [be] displaced in a direction adjacent the joint edges.

(Emphasis added)

1. Play And 35 U.S.C. § 112, ¶ 6

Unilin contends that certain limitations of the asserted claims, viz., "first locking member" and "second locking member," should be interpreted under 35 U.S.C. § 112, ¶ 6 as means-plus function limitations[6] and thus require play and that while the limitations are not in the classic "means-plus-function" format, they describe a function, rather than a generally understood structure for performing that function. (RUPost at 30). Complainants argued that the asserted method claims, which Unilin seeks to have treated under 35 U.S.C.

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[6] 35 U.S.C. § 112, ¶ 6 provides guidelines for interpreting means-plus-function limitations. This section of the patent statute states:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

(Emphasis added).

§ 112, ¶ 6, contain no recitation of any function. (CRe at 25). The staff argued that sufficiently definite structure is set forth in the claims themselves "with respect to the term locking member recited in claim 2 of the '907 patent." (SPost at 15).

Complainants, in support of their position, argued that "nothing in respondents' argument for inclusion of 'play' in interpreting and ultimately construing the claim language avoids the bedrock principle that the claim construction inquiry begins and ends in all cases with the actual words of the claim." (CPost at 20, citing Renishaw, 158 F.3d at 1248). That "bedrock principle," however, refers merely to the proposition that it is manifest that a claim must explicitly recite a term in need of definition before a definition may enter the claim from the written description. Id. Moreover, Renishaw and other recent Federal Circuit cases demonstrate that while one may not read a limitation into a claim from the written description, one may look to the written description to explicitly or implicitly define a term already in a claim limitation, (Bell Atlantic Network Servs., Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 59 U.S.P.Q.2d 1865, 1870-71 (Fed. Cir. 2001); Vitronics, 90 F.3d at 582, 39 U.S.P.Q.2d at 1577), for a claim must be read in view of the specification of which the claim is a part. Renishaw, 158

F.3d at 1248;[7] Markman, 52 F.3d at 979, 34 U.S.P.Q.2d at 1329.

Complainants argued that treating the limitations of method claims, which do not use "means for" language, under 35 U.S.C. § 112, ¶ 6 is "rare," citing O.I Corp. v. Tekmar Co., 115 F.3d 1576, 1583 (Fed. Cir. 1997). (CRe at 30). The administrative law judge however finds no language in the statute nor in case law prohibiting method claims to be so treated. In O.I. Corp., while the plaintiff argued that the district court erred in relying upon the broad recital of a purpose in a claim preamble as a function that requires application of § 112, ¶ 6 to a series of process steps, the plaintiff also argued that § 112, ¶ 6 "only applies to steps having an individually associated function, and to steps without recited acts in support thereof." Id. at 1582. In O.I. Tech, the Court stated:

> Here, the language in question is "the step[s] of... passing the analyte slug through a passage." The district Court considered the statement which appears

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[7] In Renishaw, the issue was the interpretation of the term "when" as used in claim 2 of the asserted patent (the '904 patent). The Court stated that the claim does not exist in rarefied air, but rather is surrounded by a patent disclosure of singular purpose; that as evidenced by the multiple meanings of "when," the term is patently ambiguous as used in the '904 patent; that the written description provides evidence to guide a proper interpretation of "when"; and that the plaintiffs proferred construction of "when" is so broad that it would require the Court to ignore the abounding statements in the written description that point decidedly the other way to a narrow construction. Id. at 1251, 1252. Thereafter, the Court affirmed the district court's ruling that claim 2 was not infringed because the district court properly found that one limitation of claim 2 was not satisfied. Id. at 1245.

> in the preamble, "removing water vapor from an analyte slug" as a function which invokes application of section 112, ¶ 6. We do not agree. The preamble statement of the purpose of the overall process does not constitute an associated function for the two "passing" steps of claim 9. Performing a series of steps inherently produces a result, in this case the removal of water vapor from the analyte slug, but a statement in a preamble of a result that necessarily follows from performing a series of steps does not convert each of those steps into step-plus-function clauses. The steps of "passing" are not individually associated in the claim with functions performed by the steps of passing.... If we were to construe every process claim containing steps described by an "ing" verb, such as passing, heating, reacting, transferring, etc. into a step-plus-function limitation, we would be limiting process claims in a manner never intended by Congress. Accordingly, we conclude that the "passing" limitations of claim 9 are not step-plus-function limitations subject to the requirements of section 112, ¶ 6.

Id. at 1583 (Emphasis added).

The Court however earlier stated, referring to 35 U.S.C. § 112, ¶ 6:

> This statutory provision clearly applies to claims for a combination. It is well-established of course that, in combinations that are apparatus claims, means for performing a specified function are subject to this paragraph when they lack recital of definite structure or material. Logically, structure and material make up the various means of apparatus. However, "[t]he

> word 'combination' in this paragraph includes 'not only a combination of mechanical elements, but also a combination of substances in a composition claim, or steps in a process claims.'" In re Fuetterer, 319 F.2d 259, 264, 138 U.S.P.Q. 217, 222 (C.C.P.A. 1963) (quoting P.J. Federico, Commentary on the New Patent Act, 35 U.S.C.A. Vol. 1 p. 25 (1954), reprinted in, 75 J. Pat. & Trademark Off. Soc'y 161, 186 (Mar. 1993)).

Id. at 1582 (Emphasis added).

In Generation II Orthotics Inc. v. Med. Tech. Inc., 261 F.3d 1356, 59 U.S.P.Q.2d 1919 (Fed. Cir. 2001), the Court, in referring to method claims, stated that "each limitation of each claim must be independently reviewed to determine if it is subject to the requirement of § 112, paragraph 6." Id. at 1368, 59 U.S.P.Q. at 1929. In Generation II, the Court did not preclude application of § 112, ¶ 6 to method claims. It simply stated that the mere fact that a method claim is drafted with language that is similar to the language of an apparatus claim (that has limitations construed as means-plus-function clauses) does not automatically invoke § 112, ¶ 6 analysis of the method claim limitations. Id. (citing O.I. Corp., 115 F.3d at 1583, 42 U.S.P.Q. at 1782).

In Caterpillar Inc, v. Detroit Diesel Corp., 961 F.Supp. 1249 (N.D. Ind. 1996) in issue was a method claim. The district court specifically found that 35 U.S.C. § 112, ¶ 6 applies to method claims. Id. at 1253. In so finding, the district court relied on the language of 35 U.S.C. § 112, ¶ 6, commentary by P.J. Federico — one of paragraph six's drafters — and PTO claim-drafting guidelines. Id. at 1254. The administrative law judge finds that the authorities cited by the district court fully support the conclusion that 35 U.S.C.

§ 112, ¶ 6 may apply to method claims, though the Federal Circuit has not yet construed a method claim limitation under § 112, ¶ 6.

Complainants are correct that the word "play" does not appear in any of the asserted claims of the '907 patent in issue. Also, the failure to use the word "means" in a claim element creates a rebuttable presumption that 35 U.S.C. § 112, ¶ 6 does not apply. Personalized Media Comm. LLC v. U.S. Int'l Trade Comm'n, 161 F.3d 696, 703-04 (Fed. Cir. 1998). However, though a claim limitation does not recite means for performing a particular function, it may still be construed under § 112, ¶ 6 if there is a functional term in the claim that should be accorded the same legal effect as the conventional means-plus-function language. Interspiro USA Inc. v. Figgie Int'l Inc., 815 F. Supp. 1488, 1504 27 U.S.P.Q.2d 1321, 1329 (D. Del. 1993), aff'd., 18 F.3d 927, 30 U.S.P.Q.2d 1070 (Fed. Cir. 1994). If the claim is found to nevertheless recite a function, it must then be determined whether the claim recites sufficiently definite structure in the claim for performing that function, so that § 112, ¶ 6 does not apply. Rodime v. Seagate Tech., Inc., 174 F.3d 1294, 1302, 50 U.S.P.Q.2d 1429 (Fed. Cir. 1999); Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531, 41 U.S.P.Q.2d 1001, 1006 (Fed. Cir. 1996).

Greenberg v. Ethicon-Endo Surgery Inc., 91 F.3d 1580, 1583 (Fed. Cir. 1996) has been cited by complainants for the conclusion that 35 U.S.C. § 112, ¶ 6 does not apply to the method claims in issue. Respondent Unilin argued that Greenberg is "on point" for the opposite conclusion. In Greenberg, in issue was claim 1 of the asserted patent (the '501 patent) which was directed to

> [a] surgical instrument comprising ... a sleeve ... a pair of handle members ..., a radically enlarged wheel on said sleeve and said wheel and said one handle having a cooperating detent mechanism defining the conjoint rotation of said shafts in predetermined intervals ...." [Emphasis added]

In Greenberg, the district court had concluded that the claimed element containing that term set forth a means for performing a specified function and thus was subject to the provisions of 35 U.S.C. § 112, ¶ 6. The Federal Circuit disagreed with the district court's conclusion. In reversing the district court, the Court stated first that the fact that a particular mechanism, viz. a "detent mechanism," is defined in functional terms, is not sufficient to convert a claim element containing that term into a "means for performing a specified function" within the meaning of 35 U.S.C. § 112, ¶ 6; that many devices take their names from the functions that they perform, and the examples of which are innumerable, such as "filter," "brake," "clamp," "screwdriver," or "lock;" that several of the devices at issue in Greenberg have names that describe their functions, such as "graspers," "cutters," and "suture applicators" and that "detent" (or its equivalent, "detent mechanism') is just such a term; that dictionary definitions make clear that the noun "detent" denotes a type of device with a generally understood meaning in the mechanical arts, even though the definitions are expressed in functional terms, citing Random House Unabridged Dictionary 541 (2d ed. 1993) ("a mechanism that temporarily keeps one part in a certain position relative to that of another, and can be released by applying force to one of the parts"), Webster's Third New International Dictionary 616 (1968) ("a part of a mechanism (as a catch, pawl, dog, or click) that locks or unlocks a movement") and G.H.F. Nayler, Dictionary of Mechanical Engineering (4th ed. 1996) ("A

catch or checking device, the removal of which allows machinery to work such as the detent which regulates the striking of a clock."); that while the term "detent" does not call to mind a single well-defined structure, the same could be said of other commonplace structural terms such as "clamp" or "container;" and that what is important is not simply that a "detent" or "detent mechanism" is defined in terms of what it does, but that the term as the name for structure, has a reasonably well understood meaning in the art. Id. at 1583. Hence, an issue in this investigation is whether the claim terms "first locking member" and "second locking member" are reasonably understood in the art to mean that when the members are locked, there is displaceability "in relation to each other in the direction of the adjacent joint edge." (Claim 1 of the '907 patent).

The Court, in Greenberg, as a second point, did not agree with the district court that the term "detent mechanism" in the '501 patent should be treated as synonymous with the term "detent means" simply because the patent uses the term "detent means" in place of "detent mechanism" twice in the "summary of the invention" portion of the specification. It noted that the drafter of the application that matured into the '501 patent appeared to have been enamored of the word "means," as the word was used repeatedly in the summary of the invention and that the Court's reading of the specification revealed that the term was used in that portion of the patent simply as a shorthand way of referring to each of the key structural elements of the invention with each of those elements subsequently described in detail, without the use of the term "means" in the "description of the invention" portion of the specification, and each was subsequently claimed without the use of the term "means" in claim 1 of the patent in issue. Id. at 1583-84. Hence, the administrative law judge finds that under Greenberg the specification of the '907 patent

should be used in determining whether 35 U.S.C. § 112, ¶ 6 applies to the terms "first locking member" and "second locking member."

The Court in Greenberg, as a final point, disagreed with the district court that the decision in Interspiro, 815 F.Supp. at 1488 was on point there. The Court further stated that one of the claimed elements in Interspiro was a "detent means . . . for moving and maintaining [the] movable member" in a breathing regulator for a fireman's mask, and that the district court in Interspiro characterized that element as containing means-plus-function language and therefore invoking 35 U.S.C. § 112, ¶ 6, (Id. at 1504, 27 U.S.P.Q.2d at 1329), a characterization with which the Court concurred on appeal (Greenberg, 91 F.3d at 930-31, 30 U.S.P.Q.2d at 1072). The Court noted that while the language in Interspiro was in classic "means-plus-function" format, the language in the patent at issue in Greenberg was not; that 35 U.S.C. § 112, ¶ 6 provides that an element in a claim for a combination "may be expressed" as a means for performing a function, which indicates, that the patentee is afforded the option of using the means-plus-function format; and that the question then is whether, in the selection of claim language, the patentee had exercised that option. The Court also stated that while in the Interspiro case the patentee's choice of "means-plus-function" language made it clear that the patentee had elected to invoke 35 U.S.C. § 112, ¶ 6, in Greenberg, by contrast, the element in question did not use conventional "means-plus-function" language, no other element of the claim was in means-plus-function form, and there was nothing cited to the Court from the prosecution history or elsewhere that suggested that the patentee intended to claim in that fashion. Greenberg, 91 F.3d at 1583, 1584. Therefore, pursuant to Greenberg, the administrative law judge should consider the prosecution history of the '907 patent, in

determining the intent of the patentee before the present controversy commenced.

The Court in Greenberg, moreover, did not suggest that 35 U.S.C. § 112, ¶ 6 is triggered only if the claims use the word "means." Thus, it stated that the PTO had already rejected the argument that only the term "means" will invoke said section, citing 1162 O.G. 59 n.2 (May 17, 1994), a decision with which the Court agreed, citing Raytheon Co. v. Roper Corp., 724 F.2d 951,957, 220 U.S.P.Q. 592, 597 (Fed. Cir. 1983), cert. denied., 469 U.S. 835 (1984) (construing functional language, introduced by "so that" to be equivalent to "means for" claim language). The Court concluded that, because it had not found a reason to depart from the general principle that the use of the term "means" generally invoke 35 U.S.C. § 112, ¶ 6 and that the use of a different formulation generally does not involve 35 U.S.C. § 112, ¶ 6, the phrase "cooperating detent mechanism defining the conjoint rotation of said shafts in predetermined intervals" was not intended to invoke 35 U.S.C. § 112, ¶ 6 and should not be construed to do so. Greenberg, 91 F.3d at 1584.

Based on Personalized Media and Greenberg, the language of the asserted claims, the specification of the '907 patent including its embodiments, and the history of the '907 patent should be examined to determine whether 35 U.S.C. § 112, ¶ 6 applies to the terms "first locking member" and "second locking member" of the asserted claims.

(a) Asserted Claims

The terms in issue are the phrases "first locking member" and "second locking member."[8] Moreover the claims in issue have the critical language:

> two panels are . . . (iii) mechanically, locked to each other in a second direction, . . . as of result of a first locking member disposed at one of the adjacent edges

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[8] Here the preamble aids in reading and understanding the claim, and contains a description of certain elements of the invention not provided in the body of the claim such as "first locking member" and "second locking member." Cf. Marston v. J.C. Penney Co., 353 F.2d 976, 986, 148 U.S.P.Q, 25, 33 (4th Cir. 1965) (holding that the preamble should not be used in construing the claims because it states a purpose or intended use and the remainder of the claim completely defines the invention independent of the preamble). "When the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined . . . is the one the patent protects." Bell Communications v. Vitalink Communication Corp., 55 F.3d 615, 620, 34 U.S.P.Q.2d 1816, 1820 (Fed. Cir. 1995) (citing In re Paulsen, 30 F.3d 1475, 1479, 31 U.S.P.Q.2d 1671, 1673 (Fed. Cir. 1994)). Also, the preamble to claim 1 provides relational information on the structures used to practice the claimed method. For example, the preamble defines the location of the panels in the "first mutual position" and the "second mutual position" and the claim provides the steps of laying and mechanically joining the floor panels and in doing so refers back to the "said" first and second mutual positions of the preamble. Therefore, although those elements reside in the preamble, the preamble of claim 1 of the '907 patent "breathes life and meaning" into the claim, and thus may be used to interpret the meaning and scope of the asserted claims of the '907 patent. See Kropa v. Robie, 187 F.2d 150, 152, 88 U.S.P.Q. 478, 480-81 (C.C.P.A. 1951).

being connected to a second locking member disposed at the other one of the adjacent edges, and (iv) being displaceable in relation to each other in the direction of the adjacent joint edges.

(Emphasis added). The administrative law judge finds that each of the terms "first locking member" and "second locking member" is functional language. While the fact that the "first locking member" and the "second locking member" are defined in functional language is not sufficient to convert said claim elements into a "means for performing a specified function" within the meaning of 35 U.S.C. § 112, ¶ 6, with respect to the claimed term "locking member," the term has the word "locking" viz., the associated function of locking. Webster's Third New International Unabridged Dictionary (1965) at 1328 defines "lock" as "to hold fast or inactive," and "to make fast by or as if by the interlacing or interlocking of parts < ~ ing arms across the table >." Neither complainants nor the staff has cited any dictionary definition which provides that the claimed locking members involve displaceability.

Claim 1 of the '907 patent discloses "[a] method for laying and mechanically joining floor panels in parallel rows," wherein the mechanical connections joining adjacent floor panels are formed, in part, by a "first locking member" and a "second locking member". '907 patent, col. 10, ln. 35-52. The "first locking member" and the "second locking member" are located on the opposing edges of adjacent floor panels. Id. at col. 10, ln. 47-50. According to the method disclosed in claim 1, a new panel is connected to an adjacent panel in the same row as the new panel is being laid in (the second panel), and the new panel is then connected to a previously laid panel in the row preceding the row in which the new panel is being laid (the first panel). Id. at col. 10, ln.

53-col. 11, ln. 3. The new panel is connected to both the first panel and the second panel, so that it is mechanically locked to the adjacent panels in a "first direction that is at right angles to the common plane" (i.e., in the vertical direction) and "a second direction, that is at right angles to said first direction and to the adjacent joint edges" (i.e., in the horizontal direction perpendicular to the joint edges). The panels being locked together in the second direction is a "result" of the "first locking member" being connected to the "second locking member." Id. at col. 10, ln. 45-50. No description of the structures used to effect the locking of the adjacent panels in the vertical direction is provided in claim 1; nor is there any description of how the "first" and "second locking member[s]" are to be connected.

Although locked in the "first direction" and the "second direction" on one side to the second panel and on another side to the first panel, the new panel is displaceable along the adjacent joint edges in the relation to the first panel and the second panels. Id. at col. 10, ln 50-col. 11, ln. 3. Furthermore, the new panel and the second panel can be locked with the first panel in the vertical and the horizontal direction perpendicular to the adjacent joint edges by holding the new and second panels in an angled position to the first panel, so that the upper portions of the adjacent edges of the panels are in contact with each other, and then angling the second and new panels down so that they lay flat relative to the first panel. Id. at col. 10, ln. 39-col. 11, ln. 3.

Therefore, other than the disclosure of a "first locking member" and a "second locking member", no other structures are recited or described in claim 1 to allow adjacent panels to be mechanically locked together in the horizontal direction perpendicular to the adjacent joint edges or in the vertical direction. No description of the "first" and "second locking

member[s]" is provided in claim 1, other than to describe them as being located on adjacent joint edges. Their geometry and dimensions are completely undisclosed. The "first" and "second locking member[s]" can be connected in an indeterminate manner, so as to lock adjacent panels in the horizontal direction perpendicular to the adjacent joint edge.

Claim 2 of the '907 patent is dependent on claim 1, and describes the "first locking member" as a "locking groove" and the "second locking member" as a "locking element which is received in the locking groove." Id. at col. 11, ln. 4-7. No description is provided of the structure of either the "locking groove" or the "locking element". Claim 2 specifies that the "locking element" is to be received by the "locking groove," but offers no description as to how, or with what specific structures, that is to occur. Furthermore, claim 2 does not recite any structure which allows adjacent panels to be locked together in the vertical direction.

Claim 3 of the '907 patent depends on claim 1, and provides further description of the structures used for locking adjacent panels together other than that provided in claim 1.

(b) Specification

The abstract, which is separate from the specification, is set forth in the additional findings. (FF 108). The administrative law judge finds that the language of the abstract discloses no structure for allowing mutual displacement of the joined panels other than what is disclosed in the claims in issue, the administrative law judge has found this claim language lacking in description of the locking structure.

Referring to what is disclosed in the '907 patent as "Technical Field," while it is stated under that subheading

that the locking device comprises a locking groove which extends parallel to and spaced from the joint edge of one of the panels, and said locking groove is open at the rear side of said one panel (FF 109). the administrative law judge finds nothing in that language which defines any structure with respect to enabling the claimed displaceability. Likewise, the language in the '907 patent under the subheading "Background Of the Invention" (FF 110, 111) is devoid of any description of structures which would enable displacement.

The first reference to any displacement in the '907 patent is found under the subheading "Technical Problems And Objects Of The Invention" (FF 114). Thus, it is stated therein:

> Thus, the invention provides a system for making a joint along adjacent joint edges of two building panels, especially floor panels, in which joint: the adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, and a locking device arranged on the rear side of the panels forms a second mechanical connection locking the panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges . . . said system being characterized in . . . that the panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection, that the first and the second mechanical connection both allow mutual displacement of the panels in the direction of the joint edges.

(Emphasis added). As to the "play" referred to, supra, it is later stated in the specification that disassembly can be achieved even if that "play" between the locking groove and the locking surface is not greater than 0.2 mm. (FF 115). The administrative law judge finds that the above portion (FF 114) of the '907 patent discloses that "play" is required for the claimed displacement.

The '907 patent, under the subheading "Description Of Drawing Figures" has language (FF 117) that briefly describes a first embodiment (FIGs. 1a and 1b), a second embodiment (FIGs. 2a-c, FIGs. 4a and 4b), another method for mechanically joining the floor panels of FIGs. 2a-c (FIGs. 2a-c), a third embodiment (FIG. 5),[9] a final variant for mounting a strip on a floor panel (FIG. 6) and a second variant for mounting a strip on a floor panel (FIG. 7). The administrative law judge finds no language in that portion of the '907 patent which recites any structure.

The '907 patent, under the subheading "Description Of Preferred Embodiments" (FF 118), makes reference to "play" in the following passage:

> When the panels 1 and 2 are joined together, they can however occupy such a relative position in the direction D2 that there is a small play Δ between the locking surface 10 and the locking groove 14. This mechanical connection in the direction D2 allows mutual displacement of the panels 1, 2 in the direction

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[9] Although FIG. 5 is the only embodiment of the method for installing floor panels disclosed in the '907 patent, the locking function of the FIG. 5 embodiment is the same as in the other embodiments disclosed in the '907 patent. See CX-4 col. 9, lns. 65-66.

> of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action.

(Emphasis added). This passage refers to FIGs. 1a and 1b (the first embodiment) which show said "small play Δ between the locking surface 10 and the locking groove 14." Moreover the administrative law judge finds that this portion of the specification of the '907 patent teaches to one of ordinary skill in the art that play allows for mutual displacement.

Complainants contended that the specification contained embodiments that did not have play. Complainants, in support, argued that FIGs. 2 and 3 of the specification are embodiments which do not necessarily contain play. (CRe at 9). Complainants continued to assert this position at closing arguments (Tr. at 2440), despite the fact that their only expert witness, Limbert, and the inventor, Pervan, both admitted that the drawings clearly depicted a gap between the locking surface and the locking element in both figures. (Pervan, Tr. at 358-61; Limbert, Tr. at 933-34, 945; see also FF 125, 126). Pervan also admitted that play is a "very, very tiny, very tiny gap," (Pervan, Tr. at 291), a view adopted by complainants at the closing arguments when complainants' counsel observed that "I think we all agree that play is the gap, the air space." (Tr. at 2442). Pervan further testified that although there may be situations where the amount of play in a joint is too small to see, whenever Pervan could see play "then there is a play" in the joint. (Pervan, Tr. at 291).

Complainants' sole basis for asserting that FIGs. 2 and 3 could be interpreted to depict a joint without play was because the gap or space which is clearly present in those figures, is not labeled with the delta sign (Δ), which is meant to indicate

play, in contrast to the space or gap in FIG. 1.[10] (CPost at 10). The administrative law judge rejects complainants' argument for several reasons. First, although it is true that the embodiments shown in FIGs. 2 and 3 have gaps or spaces between the locking surface of the locking element and the locking groove which are not labeled with the delta sign, gaps are clearly depicted between the locking surface of the locking element and the locking groove. This is in stark contrast to FIG. 4 of Pervan's Swedish patent application which clearly depicts a joint with no visible gap or space between the locking surface of the locking element or the locking groove. (RX-1359, Fig. 4). Said drawing of a joint without a gap or a space at that location, as even Pervan admitted, depicts a joint without play, even though the lack of gap or a space between the locking groove and the locking surface of the locking element is not called out. (Pervan, Tr. at 353). The

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[10] The staff, in its post hearing brief, argued that "the drawings, by themselves disclose to one of ordinary skill in the art embodiments without 'play'. For example Figure 1(b) shows a mechanical connection with play, which is marked by a Δ sign, while Figures 2-7 do not expressly show play." (SFF 31). Therefore, one of ordinary skill could readily interpret those figures as teaching an embodiment without play. (SPost at 10-11). This position is directly contrary to the staff's later position in its posthearing brief that the "only" structure expressly disclosed in the Pervan specification is a structure that requires play, and therefore any claims that are to be interpreted in accordance to 35 U.S.C. § 112, ¶ 6 should be interpreted as containing play. (SPost at 16). At closing arguments, when the staff was asked about the contradictory positions taken in its brief, the staff disavowed the earlier position stating that the statement on pages 10 and 11 of its brief "just didn't get written the way I wanted it to with the time crunch. What I was trying to say, Your Honor, is that I agree with respondents that there are no embodiments shown in the Pervan specification that lack play." (Tr. at 2482-83).

embodiments in FIGs. 2 and 3 are similar in appearance to the embodiment depicted in FIG. 1. The gaps or spaces that appear in FIGs. 2 and 3 are in the same location and are roughly the same size as the gap that appears in FIG. 1. The administrative law judge finds that in such a situation, the fact that a feature is explicitly identified in the first drawing and not explicitly identified in subsequent figures, does not indicate that the feature is optional in the subsequent figures, as complainants argued, but rather that the patentee Pervan after explicitly identifying the feature in the first drawing did not believe it was necessary to explicitly identify the exact same feature, in subsequent drawings depicting similar embodiments. Such an interpretation is supported by the fact that the specification of the '907 patent explicitly calls out the presence of a space between the locking surface of the locking element and the locking groove in FIG. 2:

> Preferably, the locking surface 10 is so located relative to the joint edge 3 that when the groove panel 2 is, starting from the joined position in FIG. 2C is pressed horizontally in the direction D2 against the strip panel 1 and is turned angularly up from the strip 6, the maximum distance between the axis of rotation of the groove panel 2 and the locking surface 10 of the locking groove[11] is such that the locking element 8 can leave the locking groove without coming into contact with it.

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[11] Although this passage refers to the locking surface 10 being part of the locking groove, the administrative law judge finds, from FIG. 2, that the locking surface 10 is part of the locking element 8 not the locking groove. To avoid any confusion the locking surface 10 will be referred to as the locking surface of the locking element, not the locking surface of the locking groove.

(CX-5, Col. 9, ln. 4-12). (Emphasis added). The administrative law judge finds that the passage, supra, makes it clear that there is a maximum distance between the axis of rotation and the locking surface of the locking element, implying that there are other distances less than the maximum distance between those two features and that this maximum distance is achieved when the groove panel is pressed towards the strip panel. As FIGs. 1, 2 and 3 of the '907 patent make clear, if a play exists in the joint between the locking surface of the locking element and the locking groove the play there can be eliminated if the panels are shifted away from each other, but a new space, a play, would be created in between the edges of the panels' upper surfaces.

Complainants argued at closing arguments that the panels could be shifted apart so as to eliminate the play between the locking surface of the locking element and the locking groove. (Tr. at 2451). However that action would create a new gap in between the edges of the two joined panels. The administrative law judge finds furthermore that the size of the gap would continue to increase as the panels are shifted apart until the locking surface of the locking element and locking groove come into contact with each other. This position would represent the maximum distance separating the surfaces of the two adjacent surface panels and the minimum distance between the upper surface edge of the groove panel and the locking surface of the locking element. At this point the administrative law judge finds it would be impossible to rotate the locking element out of the locking groove without the two coming into contact, as the two would already be in contact with each other in the beginning of any such rotation.[12]

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[12] The space between the panels could be eliminated by pressing the panels together, causing the creation of play between the locking surface of the locking element and the locking groove at the

Complainants relied upon two passages from the specifications to support their contention that the specification contain embodiments without play. The first passage is:

> Within the scope of the invention, there may thus exist means, such as glue or mechanical devices, that can counteract or prevent such displacement or upward angling.

(CX-5, Col. 4, ln. 46-49). Complainants argued that this is a reference to an embodiment without play and that in such an embodiment play could be eliminated and displacement and upward angling need only be counteracted and not prevented. (Tr. at 2240). Accordingly, complainants argued that counteracting displacement or upward angling could mean to "impede" such movement, rather than "stopping it all together". (Tr. at 2240). The word "counteract" is defined as "to make ineffective or restrain or neutralize the usu. ill effects by an opposite force." Webster's Ninth New Collegiate Dictionary 297 (1983). Therefore, even if the administrative law judge were to accept that that portion of the specification relied upon by complainants is a reference to an embodiment without play, which he does not, in such an embodiment displacement and upward angling would be "ma[de] ineffective", "restrain[ed]" or "neutraliz[ed]". Such

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same time as the space between the panels diminishes. The space in between the upper surfaces of the panels would disappear when those surfaces come into contact with each other, the upper edge of the surface of the groove panel would not be able to move further away from the locking surface of the locking element at this point and therefore this would be the maximum distance between the locking groove and the locking surface of the locking element. At this point the maximum amount of play would exist between, the locking surface of the locking element and the locking groove.

a finding would support respondents' arguments that play is needed for displacement and upward angling. In addition, it is not clear that this passage is a reference to an embodiment without play because, as even complainants' counsel so admitted during closing arguments, no structure is disclosed. (Tr. at 2444). For instance, as FIGs. 1, 2, and 3 of the '907 patent make clear, if one were to glue the upper surfaces of two adjacent panels together, it would not necessarily eliminate the play between the locking groove and locking surface of the locking element, as such gluing would only decrease the amount of play at that point by the thickness of the glue used to glue the upper surfaces together.

The second passage of the specification complainants relied on as support for the disclosure of an embodiment without play reads:

> If the floor panels consist of compact laminate and if silicone or any other sealing compound, a rubber strip or any other sealing device is applied prior to laying between the flat projecting part of the strip 6 and the groove panel 2 and/or in recess 26 a moisture proof floor is obtained.

(CX-5, Col. 9, ln. 48-53).[13] The administrative law judge finds no structure disclosed in this passage. In fact, there is no recess 26 depicted in the figures. While complainants theorized that recess 26 was actually a reference to the space between the upper surfaces of the floor panels arguing:

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[13] Complainants cited no other portions of the specification to support their argument that the specification contained embodiments without play. (Tr. at 2452).

> Well, if you put a sealant or a rubber strip in the space which is 28, which is the top surface of the floor where the two panels come together, that's going to cause the panels, that's going to fill what would otherwise be a gap there, and what is shown as play is going to disappear because panel E is going to move - the panel on the right is going to move slightly to the right when you close the gap, when you close the panels together, and that's exactly what would happen

(Tr. at 2451), there is no mention of the dimensions of the rubber strip or the characteristics of the sealants. Furthermore, complainants' own expert, Limbert, admitted that if the space at 28 were filled with an elasticized or rubberized material so as to seal that gap, such material would become compressed when the joint edges slide against it, allowing for the creation of play between the locking groove and the locking surface of the locking element. (Tr. at 2137). The administrative law judge finds no specific structure disclosed by this passage other than the presence of a piece of rubber or of another unidentified sealant of indeterminate dimensions. In fact, complainants' argument that a piece of rubber, or other substance, can be fitted into the space between two panels so as to eliminate the play in that joint is premised on the joint disclosed in the '907 patent which would allow the panels to be forced apart upon the insertion of rubber or other material and between the panels because the joint of the '907 patent has play.

Complainants and the staff argued that the portions of the specification where the word "play" is used (FF 114, 115, 118) do not state that the joining of panels require play but rather use the permissive language "can." (CPost at 24-27, SPost at 8-9). However neither complainants nor the staff have pointed to any plausible support in the specification for

an alternative structure that does not require play. Furthermore, "can" is defined as "be inherently able or designed to", Webster's Ninth New Collegiate Dictionary at 200 (1984), and should not be used as a substitute as "may." The Elements of Style, Strunk & White at 42 (3rd ed. 1979).[14] The patentee of the asserted patents in this investigation appears to have been aware of the differences in the proper use of "may" and "can", as the following sentence illustrates:

> Within the scope of the invention, there may thus exist means, such as glue and mechanical devices, that can counteract or prevent such displacement and/or upwardly angling.

('907 patent, col. 4, ln, 45-48). As even complainants' expert, Limbert, admitted, at least within the context of the preceding sentence, the patentee used "can" to mean "to be capable of", whereas he used "may" to indicate permissive language. (Tr. at 2177). Nor is defining "can" as "be[ing] inherently able or designed to" inconsistent with the use of "can" as it is used with play in the specification, as "can" is able to be

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[14] Even those situations where it has been noted that "can" is used most commonly as a substitute for "may" are inapposite to the instant situation. As noted in Webster's Ninth New Collegiate Dictionary at 200, "can" and "may" are frequently used interchangeably when

> denoting possibility; because the possibility of one's doing something may depend on another's acquiescence, they have also become interchangeable in the sense of denoting permission.

The existence or non-existence of permission is irrelevant to an inanimate joint, as is "another's acquiescence."

substituted by "be[ing] inherently able or designed to" yielding the following grammatically correct language:

> that the panels, when joined together, [are inherently able or designed to] occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in the said second mechanical connection . . . .

('907 patent, col. 4, ln. 15-20);

> Such a disassembly [is inherently able or designed to] be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2mm.

(Id. at col. 5, ln. 27-29); and

> When panels 1 and 2 are joined together, they [are inherently able or designed to] however to occupy such a relative position in the direction D2 that there is a small play between the locking surface 10 and the locking groove 14.

(Id. at col. 7, ln. 37-41).

Complainants and the staff argued during closing arguments that there was no inconsistency in that all of asserted claims, except claim 1 of the '410 patent, called for the panels to be connected or locked in the vertical direction and in the horizontal direction perpendicular to the joint edges, while allowing the panels to retain their displacability in the horizontal direction running parallel to the joint edges. (Tr. at 2501-08) However the asserted claims fail to provide

sufficient information for one of ordinary skill in the art to implement such a structure without undue experimentation. As stated infra, with respect to each of '907, '410, and '267 patents, the asserted claims give no information regarding the structures that are to be used to lock the panels in the vertical direction, yet allow the panels to be displaced along their joint edges while being also locked in the horizontal direction running perpendicular to the joint edge. One seeking to practice the inventions in the asserted claims, and who did not resort to the specifications, would have no indication on how to arrive at a locking mechanism that locked only in the vertical direction and allowed a new panel to be connected in a second direction by angling it in relation to a previously laid panel and then lowering it down. The problem with the asserted claims of the '267 patent are even more pronounced as those claims fail to specify which direction the "second direction" even lies, only stating that in this unknown direction the panels are connected and that they can be displaced along their joint edges while locked together in the vertical direction. See, infra.

At closing arguments, the staff argued that the "there is sufficient information in the specification that would teach a person of ordinary skill that would sufficiently enable such embodiments [without play]." (Tr. at 2482-83). Although the staff admitted that there was no other language in the specification to teach one of ordinary skill in the art a structure without play, other than the aforementioned language that complainants cited, it argued that the case law cited by complainants has held that a patentee does not need to show every single embodiment that the claims could cover, especially in mechanical cases where the patentee discloses only one embodiment, and where one of ordinary skill in the art would understand that other embodiments existed. (Tr. at 2484).

Cedarapids, Inc. v. Nordberg, Inc., 121 F.3d 727, 1997 WL 452801 (Fed. Cir. 1997) (unpublished and nonprecedential)[15] was cited by the complainants as support for the proposition that, in the mechanical arts, a broad claim can be enabled by a disclosure of single embodiment. Besides being nonprecedential, that case is also inapposite as the Court found in Cedarapids that the disputed claim was enabled because:

> All that is claimed is a method to increase productivity of rock crushers by simultaneously increasing speed and throw. While it may require experimentation to arrive at the optimum level of the simultaneous increases for various size crushers, we have never held that a patent must disclose information sufficient to manufacture a commercial product incorporating the invention.

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[15] Cedarapids is listed on the table beginning on 121 F.3d 725 with the following disclaimer:

> [t]he following opinions, judgments of affirmance without opinion and dismissal orders will not be published in a printed volume because they do not add significantly to the body of law and are not of widespread interest. They are public record. They are not citable as precedent. [Emphasis added]

Despite the listing of Cedarapids in the table, complainants saw fit not only to cite Cedarapids in their post hearing brief, in disregard of the Federal Circuit's Rule 47.6, but they also miscited the case in both the body of their brief and in the table of authorities, failing to acknowledge the nonprecedential nature of the case. See Burke, Inc. v. Bruno Independent Living Aids, Ind., 183 F.3d 1334, 1337-38 (Fed. Cir. 1999).

* * * *

> The district court recognized that the specification enabled one skilled in the art to practice the invention on a seven foot crusher in that it disclosed clearly that throw can be increased by as much as 40% and speed can be increased by as much as 100% over standard settings. The failure to recite the optimal amount of increase and relationship between speed and throw for crushers of various other sizes does not render the non-enabling. The district court found that the specified values for any conical crusher were readily ascertainable, that persons of skill in the art knew the characteristics of crusher performance, and that persons of skill in the art knew how to increase speed and/or throw.

Id. at *3 (Emphasis added). As seen from the foregoing, all that was claimed in Cedarapids was "a method to increase productivity of rock crushers by simultaneously increasing speed and throw." The Court found that the patent covered other embodiments that were not specifically disclosed in the patent, since those embodiments would be implemented by increasing their speed or throw. Therefore, the patent in Cedarapids clearly discloses the principal with which these embodiments operated. In the instant investigation, the disputed patents teach only how to implement the claimed inventions by employing a joint with play, and there is no disclosure of a joint without play, or of the basic principles that one of ordinary skill in the art could utilize to implement the claimed method using joints without play.

Complainants relied on In re Vickers, 141 F.2d 522, 526-27 (1944) for stating the general rule that "in a mechanical case an applicant may generally draw a broad claim on a

single construction." Complainants' reliance on Vickers is likewise misplaced. The Court in Vickers construed the claim to cover an embodiment of an oil well pumping apparatus that used a single piston to operate the valves, even though the single embodiment in the patent used two pistons to operate the valves, finding that:

> It was apparent from the quoted excerpt that the accumulator piston may be used not only to effect normal reversal of the directional valve, but also to delay the operation of that valve for the purpose of replenishing the system. Accordingly it is plainly suggested in appellants' specification that the accumulator piston alone may operate the valves for the purposes set forth in the appealed claims.

Id. at 990-91. (Emphasis added) The administrative law judge has found that in contrast to the finding in Vickers, a joint without play is not "plainly suggested" by the specification.

In In re Newton, 414 F.2d 1400 (1969) cited by complainants, the Court, while observing the general rule that "an applicant in a mechanical case is allowed claims, when the art permits, which cover more than the specific embodiment shown," stated that "'[t]he specification must set forth the precise invention for which a patent is solicited in such manner as to distinguish it from other inventions and from what is old.'" Id. at 1470-71 (quoting Patent Office Rule 71(b)). The administrative law judge finds that the patents in issue set forth the precise invention solicited, viz., embodiments utilizing a joint with play.

(c) Development Of Inventions In Issue Including Related Applications

The patents in issue claim priority to an original Swedish application SE9,301,595, filed in Sweden on May 10, 1993. (FF 76). Prior to the filing of the Swedish application, the conventional laminate flooring products that were on the market had a tongue and groove which formed a lock. (Tr. at 239). White glues were typically used to join the laminate panels that were made with a tongue and groove. (Tr. at 239). Tony Pervan is the sole named inventor of each of the patents in issue. The record establishes that the inventor's father related to the inventor in early 1993 how effective and ineffective the typical glues were in joining the compact laminate panels which the father was thinking about making a product out of and further told Tony Pervan that he had started up a project and wanted Tony Pervan to work on the problem of joining the panel together. According to the inventor, his father implicitly asked him to develop a method of joining panels together. (Tr. at 240). The inventor was not told what method to study and the inventor's father made no suggestion of any particular method to devise to connect the panels together. All Tony Pervan was told in early 1993 by his father was that the conventional standard method of gluing the floor panels together with the groove and tongue did not work. Tony Pervan agreed to undertake the project for his father. (Tr. at 241). Because Tony Pervan always used his computers to solve problems, he went to his computer and started to work on the problem. Using the computer and his favorite software, he started to draw out the floor boards and to think and work with the computer model.(Tr. at 242).

Tony Pervan, in early 1993, worked on the project full-time for approximately three weeks and then he presented to his father a solution which included sending him

approximately 20 drawings that had been created with Tony Pervan's software. (Tr. at 244-5). Some of the drawings sent to the father ended up in the Swedish priority application (RX 1359) for the three patents in issue. (Tr. at 245). What Tony Pervan presented to his father was a solution of how to join panels mechanically on all four sides and the angle slide snap method of installing such panels. (Tr. at 247). Thereafter Tony Pervan's father suggested that a patent should be pursued. (Tr. at 248). The suggestion resulted in the filing of the Swedish priority document on May 10, 1993 in Sweden. Each of the patents in issue claim priority to this document. (FF 76). (Tr at 249). The Swedish priority document (RX 1359) had one independent claim which read:

1. A joint for thin floating hard floors consisting of grooves (3), a fillet (4) and a layer of glue of double-adhesive tape or glue (5), characterized in that grooves (3) are provided on the bottom side of the long sides and the short sides of the floor sheets, so that the distance from the surface (6) of the floor sheets to the groove always maintains a constant measure being somewhat smaller than the minimum thickness of the floor sheets, said fillet (4) having a layer of glue (5) and a width corresponding to the double groove width and having a thickness including the layer of glue which is somewhat larger than the maximum difference between the thinnest (1) and the thickest (2) floor sheet, and said fillet being glued on the bottom side of one floor sheet (2) so that half the width of the fillet, being coated with glue or double-adhesive tape, projects, and on which projection, upon floor-laying, the other floor sheet (1) will be arranged edge to edge, so that, in the joint, both floor sheets rest on the fillet along.

(Emphasis added). The description of the drawings in the Swedish patent was as follows:

> Fig. 1 represents joining the thin floating hard floor with glue and double-adhesive tape.
>
> Fig. 2 represents joining of thin floating hard floors with glue and double-adhesive tape, the joint edges being bevelled for the transfer of lifting force to shearing force.
>
> Fig. 3 represents joining of thin floating hard floors with glue and double-adhesive tape, grooves being formed in joint edges for mechanical locking of upward motion.
>
> Fig. 4 represents joining of thin floating hard floors with mechanical locking in all directions

(Emphasis added). As seen from independent claim 1 and description of the drawings supra, glue and double-adhesive tape were emphasized. In the drawings the only mechanical locking joint that did not use glue and tape was depicted in the Fig. 4 and it did not have play. (Tr. at 353).

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On April 29, 1994, Tony Pervan filed PCT Application No. PCT/SE94/00386 which claimed priority to the Swedish priority document. (FF 78). The PCT application forms the basis of each of the three patents in issue and the PCT specification is common to the specification of said patents. (FF 78). The FIGs. of the PCT application are identical to the figures in the patents in issue which the administrative law judge finds show the existence play. Significantly the PCT application does not mention the double-sided tape inventions described and claimed in the original Swedish priority document, and the PCT application excluded, the only drawing of a mechanical locking joint without play found in said Swedish application. (Tr. at 353, 354, 361, FF 79).

In an "International Preliminary Examining Report," dated March 27, 1995 of the European Patent Office (FF 86), with respect to claims 1-19 that were submitted in the PCT application, it was stated that none of the cited art describes a system where a play exists between the locking groove (14) and the locking element (8), where the connection allows mutual displacement of the panels in the direction of the joint edges and where the connection is so conceived as to allow the locking element to leave the groove (14) if the groove panel (2) is turned about its joint edge angularly away from the strip. (FF 80). In addition, it was represented on behalf of Tony Pervan, in a submission dated June 26, 1997 to the European Patent Office, that the limitation in the claimed

invention of the PCT application that the panels when joined together can occupy a relative position in the second direction where a play exists between the locking groove and the locking surface of the locking element was introduced into the claim mainly in order to distinguish the invention from prior art spring clips, where the spring clips are biased towards the adjacent joint edges. (FF 81).

The disadvantage of spring clips was pointed out in the patents in issue. Thus the specification of the '907 patent, under the subheading "Background Of The Invention," commented on the prior art stating that using clips, as mentioned in SE 450,141, or similar techniques, have certain drawbacks (see FF 111) and are not a viable alternative and that certain biased clips, at least, cannot be used for joining panels as thin as 3 mm. (FF 112).

Each of the '907 patent, the '267 patent and the '410 patent has the same parent Application Serial No. 08/436,224 which was filed on May 17, 1995 and is now the '621 patent.[16] (FF 82). The sole original independent claim 1 of Serial No. 08/436,224 included the language (FF 84):

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[16] The claims of the '621 patent (CX- 1) include the same (and in some cases, synonymous) claim terms that are in dispute, e.g. "locking element" and "locking groove." Hence the '621 file history directly bears on the interpretation of the claim terms in dispute. See Biovail Corp. Int'l v. Andrex Pharm., Inc., 239 F.3d 1297, 1301 (Fed. Cir. 2001). The file history of the '621 patent, which is not being asserted in these proceedings, can be used in construing the asserted claims, given the common specification of the '621 patent and the three patents in issue. See Watts, 232 F.3d at 884 (applying the prosecution history arguments made in relation to a parent application to a CIP and the two other patents in suit that had a common specification).

> that the panels, when joined together, can occupy a relative position in said second direction (D2) where a play (Δ) exists between the locking groove (14) and a locking surface (10) on the locking element (8) that is facing the joint edges and is operative in said second mechanical connection.

On June 14, 1996 the Examiner rejected certain of the claimed subject matter based on U.S. Patent No. 4,819,932. (Trotter). (FF 87, 88). Applicant Tony Pervan, in a response received in the Patent Office on October 15, 1996, (FF 91) argued:

> Trotter also does not teach or suggest a system wherein two panels when joined together, occupy a relative position where a play exists between a locking groove and a locking surface on a locking element that is facing the joint edges. Specifically, Trotter uses spring clips to hold the boards together so as to prevent play from occurring between the two boards. The claimed "play" of the present invention is important for two reasons. One, it enables the panels to slide movably with respect to each other along the direction of the joint edge, which is specifically claimed in the penultimate paragraph of claim 1. This movability allows the short ends of the panels to be placed adjacent each other when installing the floor. Second, the play further enables disassembly of the floor when required.
>
> In contrast to the claimed "play" of the present invention, Trotter specifically states that an intention of his invention is to use the spring clips to hold the boards close together in order to prevent pinching. Thus, Trotter specifically prevents the claimed play.

Furthermore, the spring clips of Trotter also further prevent the claimed mutual displacement of the panels in the direction of the joint edges.

To further distinguish Trotter from the claimed "mutual displacement" feature of the present invention, the Examiner's attention is directed to column 4, lines 10-15, wherein the cleats 39 are described. As set forth in the specification of Trotter, the cleats 39 are intended to lock the spring clips 33 into the groove of the board in which the clip is attached. Thus, the cleats 39 clearly prevent any mutual displacement. Even without the cleats 39, the springlike force of the clips 33 and the edges thereof would clearly prevent any mutual displacement of the panels in a direction of the joint edges.

The Examiner, in an Office Action dated January 6, 1997 and responding to the October 15, 1996 response (FF 91), stated that claims 1-20 would be allowable if rewritten or amended to overcome certain rejections under 35 U.S.C. § 112. It was then stated:

6. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the use of adjacent joint floor paneling wherein the floor panels are interconnected by a locking element located within a groove formed on the underside in such a way so as to allow for displacement of the panels in a direction toward the joints and to allow for the locking member to be released from the groove when the panel is rotated about the joint. [Emphasis added]

Applicant Tony Pervan thereafter, in a response received by the Patent Office on June 6, 1997, amended certain claims that recited play including independent claim 1 and further submitted independent claims 21-22 and 23 which did not contain the word "play". (FF 92). However in the remarks applicant Tony Pervan stated (FF 92):

> To further define the protection to which applicant is entitled, new claims 21-23 are submitted herewith. New independent claim 21 is substantially similar to claim 1 except that it defines the strip as being integrally formed with the second edge of each of the building panels. Accordingly; claim 21 is also in condition for allowance.
>
> New independent claim 22 is substantially the same as independent claim 1 except that it does not define the play that exists between the locking groove and the locking surface. As such, displacement of the panels is still facilitated in a direction along the joints which is what is believed to be meant by the Examiner's Statement of Reasons for the indication of allowable subject matter. Accordingly, claim 22 is also patentable over the cited prior art.
>
> New independent claim 23 is similar to dependent claim 7 rewritten in independent form, except that it has omitted a couple of details of the original claim 1. Nevertheless, it is clear that the subject matter of new independent claim 23 is clearly patentable over the cited prior for the same reasons that apply to claim 1. Accordingly, new independent claim 23 is also in condition for allowance.

(Emphasis added). Significantly claim 1 recited the word "play" (FF 92). Moreover inventor Tony Pervan supra stated that while new claim 22 does not define play, "the play exists between the locking groove and the locking surface." On July 7, 1997, the Examiner issued a notice of allowability of claims 1-23 of Serial No. 08/436,224 (FF 99). The '621 patent issued on January 13, 1998. (FF 100).[17] A Request for Reexamination of the '621 patent in light of prior art was filed on May 17, 1995 (RX-366).

Given the prosecution history of the applications that relate to the patents at issue, specifically the original Swedish priority application SE9301595 and PCT Application No. PCT/SE94/00386, which claimed priority to the Swedish application, the administrative law judge finds that the

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[17] The application leading to the '907 patent was filed on November 18, 1998, as a continuation of the application that led to the '267 paint. An apparatus claim in the '907 application was rejected on double patenting in view of the '621 patent. Following withdrawal of the apparatus claim and submission of a new set of method claims, the Examiner issued a notice of allowability and gave the following statement for indication of allowable subject matter (FF 95, 96):

> 3. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the method for laying and mechanically joining parallel rows of rectangular building panels; wherein when the panels are interlocked, they are mechanically locked in a first direction that is at right angle to the plane of the panels, they are mechanically locked in a second direction that is at a right angle to the adjacent joint edges and to the first mechanically locked direction, such that when the panels are interlocked they can still [be] displaced in a direction adjacent the joint edges.

applicant's actions and arguments made in relation to those applications further support the interpretation of claims 1, 2 and 3 of the '907 patent to cover only joints with play. The applicant utilized the play aspect to overcome a prior art rejection based on the Trotter patent (FF 87, 88, 91), the prior art taught the use of biased spring clips (FF 81), the International Preliminary Report stated that none of the cited prior art references describes a system where play exists (FF 86), and the Examiner specifically stated that mutual displacement was among the reasons for allowance of the claims. (FF 91). Those facts show that play was argued and believed to be part of the invention set forth in the PCT application and the patents at issue, which have a common specification with the PCT application.

(d) Conclusion

Based on the foregoing the administrative law judge finds that 35 U.S.C. § 112, ¶ 6 applies to the claimed terms "first locking member" and "second locking member." He further finds that those structures are defined in the specification and in the relevant prosecution history as having play.

B. The '410 Patent

The '410 patent has a specification that in substance is identical to the specification of the '907 patent. Moreover, like the '907 patent, the '410 patent recites Swedish Application SE 9301595 as its priority document and also relies on PCT/SE94/00386 for priority. (FF 76, 78). Also, both the '410 patent and the '907 patent are children of the application that issued as the '621 patent.

Claims 1, 26, 39, 41 and 48 of the '410 patent, which are in issue, read:

1. An edge lock for use in a flooring system having a plurality of floor panels, the edge lock for mechanically and releasably locking together adjacent edges of pairs of adjacent floor panels during assembly of the flooring system and when said adjacent floor panels are laying flat on a subfloor with upper corner portions of said adjacent edges being mutually spaced apart, said edge lock comprising:

locking means for forming a first mechanical connection for locking said adjacent edges to each other in a vertical direction, and for forming a second mechanical connection for locking said adjacent edges to each other in a horizontal direction at right angles to said edges, said locking means including:

(i) a locking groove extending parallel to and spaced from a first one of the adjacent edges of one of the adjacent floor panels and being open at a rear side of said one adjacent floor panel, and

(ii) a flexible and resilient locking strip integrated with another of the adjacent floor panels, said locking strip extending throughout substantially an entire length of an edge of the another adjacent floor panel, said locking strip being provided with a locking element projecting from the locking strip, said locking means being constructed so as to operate as a one-way snap lock in said horizontal direction during the assembly of said flooring system when displacing said adjacent edges towards each other by resiliently urging the flexible locking strip downwards until the upper corner portions of said adjacent edges have been brought into complete engagement with each other and the locking element thereby snaps into the locking

groove to prevent drifting apart of said adjacent edges, and said locking means also being constructed so as to enable said adjacent panels, while they are mechanically connected to each other by said first and second mechanical connections, to be turned in relation to each other about said upper corner portions of their locked-together edges in an angular direction so as to move the locking element out of the locking groove in order to unlock said one-way snap lock. [Emphasis added]

26. An edge lock for use in a flooring system having a plurality of floor panels arranged in parallel panel rows and having pairs of opposite first edges and pairs of opposite second edges, the edge lock for mechanically and releasably locking together adjacent first edges of pairs of adjacent floor panels in a new row during assembly of the flooring system when said adjacent floor panels are already mechanically joined to a common second edge of a floor panel in an adjacent panel row and are laying flat on a subfloor with upper corner portions of said adjacent first edges being mutually spaced apart, said edge lock comprising:

locking means for forming a first mechanical connection for locking said adjacent first edges to each other in a vertical direction, and for forming a second mechanical connection for locking said adjacent short edges to each other in a horizontal direction at right angles to said first edges, said locking means including:

(i) a locking groove extending parallel to and spaced from a first one of the adjacent first edges of

one of the adjacent floor panels and being open at the rear side of said one adjacent floor panel, and

(ii) a flexible and resilient locking strip integrated with another of the adjacent floor panels, said locking strip extending throughout substantially an entire length of a first edge of the another adjacent floor panel, said locking strip being provided with a locking element projecting from the locking strip, said locking means being constructed so as to operate as a one-way snap lock in said horizontal direction during the assembly of said flooring system when displacing said adjacent first edges towards each other by resiliently urging the flexible locking strip downwards until upper corner portions of said adjacent first edges have been brought into complete engagement with each other and the locking element thereby snaps into the locking groove for preventing drifting apart of said adjacent first edges.

39. A flooring system comprising a plurality of rectangular floor panels which are mechanically connectable to each other in parallel rows along adjacent long edges and short edges, respectively, of the panels, said floor panels being provided with means for mechanically locking together their long edges as well as their short edges in a first direction at right angles to a principal plane of the panels, thereby forming first mechanical connections between the panels, each panel, at a rear side thereof, being provided:

(i) with a locking strip at one long edge and at one short edge, each locking strip extending throughout substantially an entire length of the corresponding

edge of the panel and being provided with a projecting locking element, and

(ii) with a locking groove at an opposite long edge and at an opposite short edge, each locking groove extending parallel to and spaced from the corresponding edge and being open at the rear side of the panel, said locking strips and locking grooves forming second mechanical connections locking the panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges such that a locking strip of a first one of two joined panels projects on the rear side of the second panel with its locking element received in the locking groove of the second panel, the first and the second mechanical connections are so constructed as to allow mutual displacement of the panels ~~in~~ the direction of the long edges, the second mechanical connection along the long edges is so constructed as to allow the locking element to leave the locking groove if the panel associated with the locking groove is turned about its long edge angularly away from the strip, and each locking strip at the short edges is flexible and resilient such that two of the floor panels, having already been mechanically joined to a common long edge of a third of the floor panels, can be mechanically joined together at their adjacent short edges by displacing said two panels horizontally towards each other, while resiliently urging the flexible strip at one of said short edges downwards, until said adjacent short edges of the two panels have been brought into complete engagement with each other horizontally and the locking element at said one short edge thereby snaps into the locking groove at the adjacent short edge.

> 41. The flooring system as claimed in claim 39, wherein the first mechanical connection as well as the second mechanical connection along the long edges are such that they allow the locking element to leave the locking groove if the panel associated with the groove is turned about its joint edge angularly away from the strip while holding the upper part of the joint edge of the panel associated with the groove in contact with the upper part of the joint edge of the adjacent panel associated with the strip.
>
> 48. The flooring system as claimed in claim 39, wherein each locking strip is integrally formed in one piece with the respective panel and forming an extension of a lower part of the corresponding edge of the respective panel.

(Emphasis added).[18] Claim 1 discloses an edge lock that can "mechanically and releaseably" lock together adjacent edges of floor panels, where the edge lock has locking means for forming the first mechanical connection that locks the panels together vertically, and for forming the second mechanical connection for locking the panels together horizontally perpendicular to the joint edges. The locking means includes (1) a locking groove on one of the panels which extends

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[18] Each of the emphasized portions, supra, of independent claims 1, 26, 39 and 41 calls for a mechanical connection that allows for the panels to be locked together vertically and another mechanical connection that allows the panels to be locked together in the horizontal direction perpendicular to the joint edge by a flexible locking strip. In addition, the emphasized portions, supra, of independent claims 1, 39 and 41 further specify that the panels be able to "undergo an angular turning" so as to release the connection made through the flexible locking strip.

parallel to and spaced from the edge and is open at the rear side, and (2) a flexible and resilient locking strip, extending substantially over the length of the edge of the opposing adjacent edge. Said locking strip has an locking element, and is constructed so as to operate as a one way snap lock, so that when the adjacent panels are displaced towards each other the locking strip is urged downward until the upper corners of the edges of the adjacent panels are in complete engagement, whereupon the locking element snaps up into the locking groove to prevent the adjacent panels from drifting apart. The locking element can be disengaged by angling the panels so as to move the locking element out of the locking groove.

Claim 26 is the same as claim 1, except that it specifies that it is a method for assembling a plurality of floor panels in parallel rows and deletes the requirement that the snap lock be able to be disengaged through angling the panels. Claim 26 does state that it is a system for "releaseably" locking adjacent panels together, it does not, however, specify any particular manner in which they can be released.

Claim 39 specifies that panels can be locked together along their long and short edges. The panels can be angled along their long edge so as to disengage the locking element from the locking groove (the second mechanical connection). The locking strip on the short edge allows adjacent short edges to be connected when the panels are already connected to other panels along their long edges, so that when the panels are displaced horizontally along the joint edge towards on opposing panel the resilient strip on one of the two panels' short edges acts as a snap lock.

Claim 41 adds the additional limitation to claim 39 that the panel with the groove can be turned angularly along its long edges while it is locked to another panel, so that when its

upper joint edge comes into contact with the upper joint edge of the adjacent panel, the locking element of the opposing panel can leave the groove. Claim 48 adds the limitation to claim 39 that the locking strips be integral to the panels.

The Examiner found allowable the claimed subject matter in issue because the prior art failed to teach the use of a flooring system having a plurality of panels which included a "first mechanical locking [means] that locks the panels together vertically" and "a second locking means that lock together horizontally." (FF 101).

1. Play And 35 U.S.C. § 112, ¶ 6

Respondent Unilin argued that the "locking means" in asserted claims 1 and 26 of the '410 patent, the "locking element" in claims 1, 26 and 39 of the '410 patent and the "means for mechanically locking" in claim 39 of the '410 patent must be construed under 35 U.S.C. § 112, ¶ 6 as covering only a joint with play, or its equivalent. (RUPost at 30). It was argued that the claims of the '410 patent include means-plus-function elements directed at the function of "construct[ing]" the locking means so as to enable particular functions.

Complainants argued that the locking means limitations of the '410 patent are "so full of structural recitations that it is quite clear that the presumption of applicability of 35 U.S.C. § 112, ¶ 6, has been completely rebutted;" that, for example, the "locking means" of independent claims 1 and 26 is said to have a "locking groove extending parallel to and spaced from a first one of the adjacent edges" and to have "a flexible and resilient locking strip integrated with another of the adjacent floor panels;" and that, in independent claim 39 in issue, the "means for mechanically locking together" is followed "by

the recitation of numerous and very detailed structural limitations, all of which clearly define the 'means' referred to in the early part of the claim." (CRe at 34, 35). Complainants further argued that "the 'constructed so as to enable' language of claims 1 and 26 of the '410 patent merely sets forth additional functional language relating to structures previously set forth in the claims." (CRe at 31).[19]

The staff argued that claims 1, 39, 41, and 48 of the '410 patent, "which each recite the language 'constructed so as to,' should be construed, pursuant to 35 U.S.C. § 112, ¶ 6, as requiring 'play'." (SPost at 16). The staff however argued that there is sufficient structure recited in claim 26 and hence 35 U.S.C. § 112, ¶ 6 is not applicable to claim 26. (Tr. at 2478).

Respondent Pergo argued that each asserted claim of the '410 patent is set forth in "means plus function" language; that for example claim 1 of the '410 patent requires a "locking means for forming" with "said locking means being construed so as to operate" and "said locking means also being constructed so as to enable" and that the recitation of the term "means" triggers a presumption that § 112, ¶ 6 applies, and the association of a function without describing any definite structure confirms that the element is a means-plus-function element. It is also argued that no structure is associated with the functional term "one-way snap lock" in claims 1 and 26 of the '410 patent. Respondent Pergo also argued that for the same factual reasons that all the asserted claims should be interpreted to require play based on the recitation of the

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[19] Independent claim 26 does not contain the language "constructed so as to enable." It does have the language "constructed so as to operate."

locking implements, the fact that the only corresponding structure disclosed in the specification of the '410 patent to which "locking means" can be related calls for play; that no embodiment of a joint without play is disclosed in the specification; that there is no basis on which the structure disclosed in the specification could be deemed equivalent to that which is its direct opposite, viz., a joint without play; and that therefore each of the asserted claims of the '410 patent is limited to flooring systems which have a locking element receivable into a locking groove where a play exists between said locking element and said locking groove, such that the displaceability, disassembly, and "one-way snap lock" required by the invention can be enabled under 35 U.S.C. § 112, ¶ 1. (RPost at 40).

Respondent Roysol argued that the "locking means" recitations of each of claims 1 and 26 in issue are plainly "means plus function" elements within the meaning of 35 U.S.C. § 112 ¶ 6 such that the coverage of said recitations is limited to the embodiments in the specification which require, inter alia, play. (RRPost at 15, 17). It was argued that claims 39, 41 and 48 are similarly limited by a means plus function recitation that the claimed floor panels have "means for mechanically locking together their long edges in a first direction at right angles to a principle plane of the panels, thereby forming first mechanical connections between the panels." Hence it was argued that the means for mechanically locking of claims 39, 41, and 48 must be construed to be limited to the structures described in the specification for performing that first mechanical connection and their equivalents. (RRPost at 18).

(a) Asserted Claims

Complainants admit that there is a presumption of applicability of 35 U.S.C. § 112, ¶ 6 to the claims in issue because of the recitation of "means."[20] Hence any structural recitations in claim 1, 26, 39, 41 and 48 have to be examined to determine if the presumption is rebutted.

Claim 1 of the '410 patent recites an edge lock with a locking means which is capable of forming two mechanical connections once locked. The "first mechanical connection" locks the adjacent panels together in a vertical direction, while the "second mechanical connection" locks the adjacent panels together in the horizontal direction.[21] (CX-5, col. 10, ln. 42-

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[20] Claim 1 of the '410 patent recites "locking means" for forming the first and second mechanical connections. Claim 26 also recites "locking means" for forming a first and a second mechanical connections and which operates as a one-way snap jock. Claim 39 provides that the flooring system has panels with means for mechanically locking together "the long and short edges of the panels. Since claims 41 and 48 depend from claim 39, the analysis of the means language in claim 39 will apply to the construction of claims 41 and 48 as well.

[21] It is unclear from the claim language itself whether the terms "first mechanical connection" and "second mechanical connection" are meant to connote that the "first mechanical connection" is formed prior to the "second mechanical connection", or whether the drafter of the claim had arbitrarily chosen to refer to the mechanical connection that locks the adjacent panels together in the vertical direction first. However, from the specification it is apparent that the mechanical connection locking the adjacent panels together in the vertical direction is formed before the engagement of the mechanical connection locking the panels together in the horizontal direction.

47). Claim 1 then provides some explanation of the structure needed to form the second mechanical connection which holds the panels together in the horizontal direction. Such structural description includes a "locking groove," which is spaced from the edge and parallel to the edge of one of the adjacent panels. (Id. at col. 10, ln. 48-50). Furthermore, this groove is open at the "rear side". (Id. at col. 10, ln. 50-51). However as even complainants admit, the specification must be used to understand the term "rear side" as the patentee acted as his own lexicographer and defined it to "'be considered to comprise any side of the panel located behind underneath the front side of the panel.'"[22] (Tr. at 2399 (quoting CX-5, col. 4, ln. 28-30)).

The locking means used to make the second mechanical connection is further described in the claim as consisting of an integral "locking strip" located on the opposing adjacent panel. (CX-5, col. 10., ln. 52-53). This locking strip is both flexible and resilient, and extends "throughout substantially" the entire length of the edge of the opposing panel. (Id. at col. 10, ln. 52-55). Furthermore, the locking strip is described as having a "locking element" projecting from it. (Id. at col. 10, ln. 56. 57).

Claim 1 of the '410 patent continues in describing how the locking strip with its locking element operates in conjunction with the locking groove in that as the adjacent edges of two panels are moved together, viz., one edge with the locking groove and the edge on the opposing panel with locking strip with locking element, the locking means acts like a "one-way

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[22] Although the patentee defines the "rear side" of the panel as any side which is "behind underneath the front side", he does not give any indication which part of the panel should be considered to be the "front side".

snap lock in the horizontal direction." (Id. at col. 10, ln. 58-59). It does so because as the opposing panels are pushed towards each other the "flexible locking strip" is "resiliently urg[ed] . . . downwards." (Id. at col. 10, ln. 60-62). The locking strip is continued to be pressed downwards until the upper portions of the edges of the opposing panels come into "complete engagement with each other", whereupon the locking element "snaps" into the locking groove to prevent the panels from drifting apart. (Id. at col. 10, ln. 62-66).

Furthermore, claim 1 of the '410 specifies that the locking means allows the panels, while they are joined in the vertical direction and the horizontal direction perpendicular to the joint edges, to be turned in relation to each about the upper corner portions of their locked edges. (Id. at col. 11, ln. 2-6). This angular rotation results in the locking element moving out of the locking groove, thus releasing the lock on the adjacent joint edges. (Id. at col. 11, ln. 6-8).

Upon review of the recited structure, the administrative law judge finds that the only claimed structure of the locking means as it relates to the second mechanical connection is that it consists of a "flexible locking strip" with a "locking element" and a "locking groove." There is no mention of the shape or dimensions of the locking strip, the locking element or the locking groove. Yet when the locking element is engaged with the locking groove thus locking the panels together in the horizontal direction, those structures, along with the unclaimed structures that make up the portion of the locking means necessary to effect the first mechanical connection, see infra, must allow the panels to be rotated in relation to each other. Furthermore, the locking strip, locking element, and locking groove must be such a size and shape, as to not only allow this rotation to occur, but also to allow at a certain point during the rotation the locking element to

disengage from the locking groove. The administrative law judge finds that such structure is missing from the description of the locking means contained in claim 1 of the '410 patent.

Furthermore, even if the contention were accepted that claim 1 provides a sufficiently detailed description of the mechanism needed for the second mechanical connection joining the panels in the horizontal direction, so as to allow that connection to perform all the functions delegated to it under claim 1, the administrative law judge finds no description of the structures needed to effect the first mechanical connection. Under claim 1 the first mechanical connection does not simply join the panels together in the vertical direction, but once engaged it must allow the panels to be rotated sufficiently so as to allow for the disengagement of the second mechanical connection. The administrative law judge finds no structure described in claim 1 that allows for the performance of either task with respect to the first mechanical connection.[23]

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[23] Complainants argued during closing arguments that the recitation of claim 1 concerning a flexible locking strip related to the first mechanical connection as that recitation "describe[s] a structure which prevents one panel from moving downward in relation to each other. That's vertical locking." (Tr. at 2475). However, claim 1 describes the locking strip as being flexible and resilient so that it is "resiliently urg[ed] downwards" as the panel are being pushed together. The administrative law judge finds such a structure, which is designed to bend, is insufficient to vertically lock the floor panels so that they would not be displaced downwards, but rather as counsel for Roysol pointed out during closing arguments "the structure that prevents . . . one panel from moving downward relative to the other is called the floor." (Tr. at 2476). Moreover, even if the administrative law judge were to accept complainants' argument that the recitation of the locking strip is a description of the structure's first mechanical connection,

Furthermore, it is also a fact that claim 1 recites an edge lock comprising a

> locking means for forming a first mechanical connection for locking said adjacent edges to each other in a vertical direction, and for forming a second mechanical connection for locking said adjacent edges to each other in a horizontal direction at right angles to said first edges . . . said locking means also being constructed so as to enable said adjacent panels, while they are mechanically connected to each other by said first and second mechanical connection, to be turned in relation to each other about said upper corner portions of their locked together edges in an angular direction so as to move the locking element out of the locking groove in order to unlock said one - way snap lock.

(Emphasis added). The administrative law judge rejects complainants' argument that the language, with respect to the "being constructed" clause supra relates to structures previously set forth in the claim. Thus the phrase specifically states "said locking means also being constructed" (Emphasis added). The administrative law judge finds no structural language in the claim as to how said adjacent panels are connected such that they can be turned in relation to each other to unlock the one-way snap lock. Accordingly, complainants' attempt to rebut the presumption of the applicability of 35 U.S.C. § 112, ¶ 6 as to "locking means" as recited in claim 1 is rejected.

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such a description, as even complainants admitted, is incomplete. (Tr. at 2475). The administrative law judge finds no structure described in claim 1 that would act, once engaged, to prevent the locked panels from drifting apart in the vertical, upward direction.

Similarly, complainants' attempt to rebut the presumption of the applicability of 35 U.S.C. § 112, ¶ 6 to claim 26 of the '410 patent is rejected. As with claim 1, claim 26 recites a locking means that is "releasabl[e]" and is capable of forming two mechanical connections.[24] (CX-5, col. 12, ln. 67 to col. 13, ln. 13). The first mechanical connection is in the vertical direction, while the second mechanical connection is the horizontal direction perpendicular to the joint edge. (Id. at col. 13, ln. 7-13). The structures recited to effect the second mechanical connection are identical to those recited in claim 26 for the second mechanical connection (i.e., a locking groove running parallel to the edge of one of the panels, and a flexible and resilient locking strip with a locking element). (Id. at col. 13. ln. 12-22). Again, the second mechanical connection is engaged in the same manner as in claim 1 (as the adjacent edges are pushed together the "flexible and resilient" locking strip is depressed until the upper edges of the panels' surfaces come into contact so that the locking element "snaps into the locking groove.") (Id. at col. 13, ln. 23-32). Furthermore, as with claim 1 of the '410 patent, the locking means, including those making, the first and second mechanical connections, must be "releasabl[e]". Unlike claim 1, claim 26 does not disclose how the locking means is to be released. (Id. at col. 12, ln. 67).

Therefore, the administrative law judge finds that the only recitation of the structure of the locking means in claim 26 of

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[24] The language of claim 26 of the '410 patent relating to the "releasably locking" function of the locking means is present in the claim preamble. The administrative law judge finds that the preamble of claim 26, like that of claim 1 of the '907 patent, should be used in construing the claim. The preamble defines the edge lock as being releasable and this further defines the claimed "locking means" as being releasable.

the '410 patent as it relates to the second mechanical connection, is that it consists of a flexible locking strip with a locking element and a locking groove. There is no mention in claim 26 of the shape or dimensions of the locking strip, the locking element or the locking groove. Yet when the locking element is engaged with the locking groove - locking the panels together in the horizontal direction perpendicular to the joint edge - those structures, along with the unclaimed structures that make up the portion of the locking means necessary to effect the first mechanical connection, see infra, must allow the panels to be released in an undisclosed manner.

Furthermore, even if complainants' contention were accepted, that claim 26 provides a sufficiently detailed description of the structure needed for the second mechanical connection joining the panels in the horizontal direction, so as to allow that connection to perform all the functions delegated to it under claim 26, as with claim 1, the administrative law judge finds no description of the structures needed to effect the first mechanical connection. Under claim 26 the first mechanical connection does not simply join the panels together in the vertical direction, but once engaged it allows the panels to be released. No structure is described in claim 26 that allows the performance of either task with respect to the first mechanical connection.

Claim 26 further provides that the second pair of edges "are already mechanically joined to a common second edge of a floor panel in an adjacent panel row" before the first edges are displaced towards each other. (CX-5, col. 13, ln. 3-5,25-26). The administrative law judge finds that no description of the structure needed to allow the necessary displacement of the first edges, while being mechanically joined to a common panel in an adjacent row, is provided.

Therefore, for the same reasons that the description of corresponding structures recited in claim 1 was found to be deficient, the description in claim 26 is found by the administrative law judge to be insufficient to rebut the presumption of applicability with regards to 35 U.S.C. § 112, ¶ 6.

Claim 39 of the '410 patent recites that the floor panels have a "means for locking together their long edges as well as their short edges" and that this means be capable of once again forming a first mechanical connection locking the panels together in the vertical direction and a second mechanical connection locking panels together in the horizontal direction. (CX-5, col. 14, ln 17-35). The structures for effecting the second mechanical connection are identical to those described in claim 1.[25] Not only is no further structure described, the locking means is given an additional function over that which is described in claim 1, not only must the locking means lock the panels together in the horizontal and vertical directions, and allow the panels to rotate relative to one another, so that at some point during this rotation the locking element will disengage from locking, the locking means must also "allow mutual displacement of the panels in the direction of the long edges." Id. at col. 14, ln. 39-41.

Therefore, in light of the previous findings regarding claim 1, the administrative law judge finds that the

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[25] In response to complainants' argument that the locking strip described in claim 1 is part of the structure needed to effect the first mechanical connection (see footnote immediately preceding this footnote), claim 26 identifies the locking strip and locking groove as being part of the structure for the second mechanical connection, not for the first mechanical connection. (CX-5, col. 14, ln. 31-33).

descriptions of structure contained in claim 39 are insufficient to take it outside of 35 U.S.C. § 112, ¶ 6.

Claim 41 depends on 39 and does not provide any further description of the structures involved in forming the first and second mechanical connection, only adding the limitation that the second mechanical connection is able to be disengaged by a particular type of angular rotation. Therefore, the administrative law judge finds that claim 39 is within the purview of 35 U.S.C. § 112, ¶ 6.

Claim 48 depends on claim 39 and limits the locking strip as being integral to the associated panel. As such, this additional limitation is found by the administrative law judge to be insufficient to take this claim out of 35 U.S.C. § 112, ¶ 6.

(b) Specification

Since the specification of the '410 patent is identical in substance to the specification of the '907 patent,[26] the findings of the administrative law judge as to the specification of the '907 patent supra apply to the analysis of the '410 patent.

(c) Development Of Inventions In Issue Including Related Applications

The '410 patent claims priority to the same Swedish document as did the '907 patent. Moreover the application which resulted in the '410 patent is related to the same PCT application and to the application from which the '621 patent

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[26] The application for the '410 patent was a continuation of the application which issued as the '907 patent. (FF 97).

issued as was the '907 patent application. Hence the findings of the administrative law judge under the '907 patent, supra, as to said Swedish priority application, the PCT application, the application which resulted in the '621 patent and the development of the invention apply to the '410 patent.

In the prosecution of the '410 patent (FF 97-101) a terminal disclaimer was filed to overcome a double patenting rejection in view of the '621 patent. (FF 97). Also one of the claims of the '410 patent, viz., dependent claim 49 which is not in issue, mentions the word "play." (FF 100). Complainants argued that because the limitation "play" is found in a claim that depends from asserted claim 39, it would violate the doctrine of claim differentiation to read the limitation "play" into asserted claim 39 of the '410 paint. The doctrine of claim differentiation however can not broaden claims beyond the scope that is supported by the specification. See ATD Corp. v. Lydall, Inc., 159 F.3d 534, 541 (Fed. Cir. 1998). Also claim differentiation has limited applicability to means-plus-function clauses. See, e.g., IMS Technology, Inc. v. Haas Automation, Inc., 206 F.3d 1422, 1431 (Fed. Cir. 2000); Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1538 (Fed. Cir. 1991): O.I. Corp., 115 F.3d at 1582 (noting construction of claims "is not based solely upon the language of other claims; the doctrine cannot alter a definition that is otherwise clear from the claim language, description, and prosecution history"); Toro Co. v. White Consolidated Indus., Inc., 199 F.3d at 1295, 1302 (Fed. Cir. 1999) (noting that the doctrine cannot be used to broaden claims beyond their meaning in light of the specification and does not override clear statements in the specification and the prosecution history); Hormone Research Found Inc. v. Genentech Inc., 904 F.2d 1558, 1567 n.15, 15 U.S.P.Q.2d at 1039, 1047 n.15 (Fed. Cir. 1990). See also Kraft Foods, Inc. v. Int'l Trading Co., 203 F.3d 1362, 1368 (Fed. Cir. 2000)

(observing that claim differentiation is not a "hard and fast rule of construction," and cannot be relied upon to "broaden claims beyond their correct scope"). Thus, since the structure disclosed in the specification of the '410 patent that performs the locking function has play, the doctrine of claim differentiation has been trumped by the mandate that claims, construed under 35 U.S.C. § 112 ¶ 6, cover the structure disclosed in the specification and equivalents thereof.

(d) Conclusion

Based on the foregoing the administrative law judge finds that the presumption of applicability of 35 U.S.C. § 112, ¶ 6 to the asserted claims of the '410 patent has not been rebutted by complainants. He further finds that the 35 U.S.C. § 112, ¶ 6 structure applicable to the asserted claims requires play.

C. The '267 Patent

The '267 patent has a specification that in substance is identical to the specification of the '907 patent. Moreover it has the same Swedish priority document and PCT application as the '907 patent. Also, the parent application of the '267 patent is Serial No. 08/436,224, which issued as the '621 patent.

Claims 19, 23 and 39 of the '267 patent, which are in issue, read:

> 19. A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising the steps of:
>
> (a) placing a new one of the panels adjacent to a long edge of a previously laid first one of the panels in

a first row and to a short edge of a previously laid second one of the panels in an adjacent second row, such that the new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position relative to said second panel and such that a long edge of the new panel is provided with a locking groove which is placed upon and in contact with a locking strip at the adjacent long edge of the first panel;

(b) subsequently angling down the new one of the panels so as to accommodate a locking element of the strip of the first panel in the locking groove of the new panel, whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked together in a first direction also; and

(c) displacing the new one of the panels in its longitudinal direction relative to the first panel towards a final longitudinal position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of the other one of the short edges, whereby the new one of the panels and the second panel are mechanically connected with each other in both the first direction and in the second direction with respect to the thus connected short edges.

23. A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising the steps of:

(a) placing a new one of the panels adjacent to a long edge of a previously laid first one of the panels in a first row and to a short edge of previously laid second one of the panels in an adjacent second row, such that the new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position relative to the second panel and such that a first locking element provided at a long edge of the new one of the panels is inserted under the adjacent long edge of the first panel being provided with a second locking element;

(b) subsequently angling down the new one of the panels so as to accommodate the locking element of the new one of the panels in the locking element of the first panel, whereby the new one of the panels and the first panel are mechanically connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new one of the panels, are in engagement with each other and thereby mechanically locked together in a first direction also; and

(c) displacing the new one of the panels in its longitudinal direction relative to the first panel towards the final position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of

the other one of the short edges, whereby the new one of the panels and the second panel are mechanically connected with each other in both in the first direction and in second direction with respect to the thus connected short edges.

39. A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising the steps of:

(a) placing a new one of the panels adjacent to one edge of a previously laid first one of the panels in a first row and to another edge of previously laid second one of the panels in an adjacent second row, while holding the new panel at an angle relative to a principal plane of the first panel, such that the new panel at an angle relative to a principal plane of the first panel, such that the new panel is spaced from its final position relative to the second panel in a direction parallel to said principal plane and such that a first locking member provided at one edge of the new panel is inserted under the adjacent one edge of the first panel being provided with a second locking member;

(b) subsequently angling down the new panel so as to engage the first locking member of the new panel with the second locking member of the first panel, whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected edges of the new panel and the first panel, wherein the connected edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked together in a first

direction that is at right angles to the principal plane of the first panel also; and

(c) displacing the new panel relative to the first panel in a direction parallel with the connected edges of the new panel and the first panel towards a final position until a locking element of one of an another edge of the new panel and the another edge of the second panel snaps up into a locking groove of the other one of the another edges, whereby the new panel and the second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected edges of the new panel and the second panel.

(Emphasis added).[27] Claim 19 of the '267 patent discloses "[a] method for laying and mechanically joining rectangular building panels in parallel rows" by positioning a new panel so that its long edge is adjacent to the long edge of a

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[27] Each of independent claims 19, 23 and 39 of the '267 patent has a step that calls for joining the panels by "angling" them together and a step calling for panels to be displaced relative to one another, along the joined edge, when they are mechanically locked together, as does each of the claims in issue in the '907 patent, supra. However, the '267 patent differs from the '907 patent in that, as the emphasized portions, supra indicate, the new panel is placed in an angled position relative to the first panel, while unconnected to the second panel in the second row. Additionally, referring to the emphasized portions, supra, of the asserted claims of the '267 patent, after the new panel is angled down so as to lock it with the first panel, it is then displaced towards the second panel, until such displacement results in the locking element on the short edge of the new panel or of the second panel snapping into the locking groove of the other panel. The method disclosed in the '907 patent does not feature this "snap action."

previously laid panel in the first row and the short edge is adjacent to a previously laid panel in the second row. The new panel is held so that it is at an angle to the first panel and is in contact with the first panel, so that the locking groove on the long edge of the new panel is in contact with the locking strip on the long edge of the first panel. The new panel is then angled down so that the first panel's locking element is accommodated into the new panel's locking groove, thus mechanically locking the new panel and the first panel together in both the horizontal direction perpendicular to the joint edge and the vertical direction. At this point, the new panel is not yet mechanically locked with the second panel in either the horizontal direction perpendicular to the joint edge or vertical direction. The new panel is then displaced towards the short edge of the second panel, until the locking element on the short edge of either the new panel or the second panel "snaps up into a locking groove" on the other panel thus locking the new panel with the second panel.

Claim 23 of the '267 patent discloses the same process as is disclosed in claim 19 except that the new panel has the locking element on its long side, which is ultimately accommodated by the locking groove located on the long side of the first panel when the new panel is angled down.

Claim 39 of the '267 patent is the same as claims 19 and 23, except that claim 39 does not specify that either the long edge of the new panel or the long edge of the first panel has a locking element or a locking groove, but rather states that locking members are located on either panel's long edge, and that the new panel is angled down "so as to engage the first locking member of the new panel with the second locking member of the first panel."

1. Play And 35 U.S.C. § 112, ¶ 6

Respondent Unilin argued that the means-plus elements of the asserted claims of the '267 patent include the following limitations: "first locking member" and "second locking member" in claim 39 of the '267 patent, "locking element" in claims 19 and 39 of the '267 patent and "first locking element" and "second locking element" in claims 23 of the '267 patent which must be construed pursuant to 35 U.S.C. § 112, ¶ 6. As was done, supra, with the asserted method claims of the '907 patent, based on Personalized Media and Greenberg the language of the asserted method claims, the specification of the '267 patent including its embodiments and the history of the '267 patent should be locked at to determine whether 35 U.S.C. § 112, ¶ 6 applies to said limitations.

(a) Asserted Claims

The asserted claims do recite the phrases "locking element" and "locking member." The words element and members are associated with the word locking, viz., the associated function of locking. Moreover claim 19 has the language:

> such that a long edge of the new panel is provided with a locking groove which is placed upon and in contact with a locking strip at the adjacent long edge of the first panel . . .
>
> whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new panel, are in engagement with

each other and thereby mechanically locked together in a first direction also; and

(e) displacing the new one of the panels in its longitudinal direction relative to the first panel towards a final longitudinal position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of the other one of the short edges,

Claim 23 has the language:

such that a first locking element provided at a long edge of the new one of the panels is inserted under the adjacent long edge of the first panel being provided with a second locking element;

(b) subsequently angling down the new one of the panels so as to accommodate the locking element of the new one of the panels in the locking element of the first panel, whereby the new one of the panels and the first panel are mechanically connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new one of the panels, are in engagement with each other and thereby mechanically locked together in a first direction also; and

(c) displacing the new one of the panels in its longitudinal direction relative to the first panel towards the final position . . .

Claim 39 has the language:

> a first locking member provided at one edge of the new panel is inserted under the adjacent one edge of the first panel being provided with a second locking member; . . .
>
> whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected edges of the new panel and the first panel, wherein the connected edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked together in a first direction that is at right angles to the principal plane of the first panel also; and
>
> (c) displacing the new panel relative to the first panel in a direction parallel with the connected edges of the new panel and the first panel towards a final position

The language, supra, as with language of the asserted claims of the '907 patent, supra, involves a structure such that when two panels are locked by a mechanical connection with the first and second locking members the two panels are able to slide movably with respect to each other along the direction of the joint edge. The administrative law judge finds no language in said claims to define the structure that performs the recited function.

Claim 19 of the '267 patent also discloses a method for "laying and mechanically joining rectangular building panels in parallel," where the long edge of the panel being laid is equipped with a locking groove and one of the previously laid panels is equipped with a locking strip. (col. 13, ln. 43-57). The locking groove and locking strip are located on their

respective panels such that they can come into contact with each other if the new panel is held at an angle against the previously laid panel. (Id. at col. 13, ln. 50-57). The locking strip of the previously laid panel has a locking element, which becomes accommodated in the locking groove when the new panel is angled down, and, as a result, the two panels become "mechanically connected" together in a "second direction" and in this angled down position the panels are in engagement along their long edges such that the panels are "mechanically locked" together in a "first direction". (Id. at col. 13, ln. 58-66). Claim 19 does not identify the actual directions that the "first direction" and "second direction" are along (i.e., whether they are in the horizontal or vertical directions or along the z axis, or up or down, or left or right).

Claim 19 further specifies that the panels, while being "mechanically connected" in the "second direction" and "mechanically locked" in the first direction, can still be displaced along their common joint edge of such that the short edge of the panel can be displaced towards the short edge of a second previously laid panel. (Id. at Col. 14, ln. 1-10). Such displacement allows the locking element of one of the short edges to be "snap[ped] up" into the locking groove of the opposing short edge and thus connecting the short edges together in the "first direction" and the "second direction". (Id.) Again, the administrative law judge finds that no description of the first and second directions is provided by the claim language.

The administrative law judge further finds that the locking structures which the method disclosed in claim 19 depends upon, are inadequately disclosed. Claim 19 of the '267 patent lists a series of steps in which functions are performed, but provides only sketchy, if not outright contradictory information regarding how those functions are to performed.

For instance, in step (b) of claim 19 the long edges of two panels are to be connected in a "second direction" and then locked in a "first direction", and while so connected, the panels are to be displaceable along the joint. From the claim language only it is impossible to know what direction the first direction is in or what direction the second direction is in. Furthermore, it is unclear as whether any difference is meant in referring to the panels to be "locked" in the "first direction" while only "connected" in the "second direction". The administrative law judge finds that claim 19 only provides the most rudimentary details concerning the structures used to enable the panels to be joined in only those two directions along their long edges. The new panel has a locking groove along its long edge, while a previously laid panel has a locking strip with a locking element along its long edge. The locking groove of the new panel is such that the locking element can be accommodated in the locking groove of the previously laid panel, but otherwise there is no indication as to the shape or dimensions of the locking strip, the locking element, or the locking groove. The administrative law judge finds no indication as to how the accommodation of the locking element into the locking groove results in the connection of the panels in the "second direction" as there is no indication of which direction the "second direction" is, or what is meant by the broad term "mechanically connected". While this connection is sufficient to bring the long sides of the opposing panels into "engagement" so that they are mechanically locked together in the "first direction", there is no indication as to how this engagement and locking together occur or what structures are used to effect it. Additionally, step (c) of claim 19 specifies that the new panel be displaced while being "connected" in the "second direction" and "locked" in the "first direction". Yet there is no indication as how the panels were able to retain their displaceability before they became engaged.

Furthermore, with respect to the locking mechanism located on the short edges of the two panels, claim 19 recites that the locking element of one of the short edges "snaps up into" the locking groove of the opposing panel, but there is no description of how this "snap[ping] up" is to occur, other than it is to be the result of displacing the new panel along the joined edge. The administrative law judge finds it unclear how this "snap[ping] up" of the locking element is to connect the panels in both the "first" and "second" directions. Also from the claim language itself it is indiscernable which directions the "first" and "second" directions lie.

The administrative law judge finds that the language contained in claim 23 of the '267 patent is even less detailed than that contained in claim 19, as claim 23 is virtually identical with claim 19 except for the substitution of the locking groove on the new panel's long side in claim 19 for a "first locking element" and similarly the locking strip with a locking element on the long side of the previously laid panel in claim 19 has been substituted for a "second locking element". (Col. 14, ln. 40-44). Therefore, in addition to all the inadequacies of the recitation of claim 19, the recitation of claim 23 presents a new problem: the "second locking element" on the long edge of the previously laid panel is capable of accommodating the "first locking element" on the long side of the new panel. (Id. at col. 14, ln. 45-48). Thus, the term "locking element" in claim 23 is found to refer to a different structure than the term "locking element" referred to in claim 19 because the "locking element" of claim 19 referenced a protrusion on the locking strip capable of fitting into a locking groove. The administrative law judge finds that the "locking element" in claim 23 cannot refer to the same structure referenced in claim 19 because the "second locking element" would be unable to accommodate the "first locking

element.[28] However claim 23 is found to recite no alternative structure for either the "first locking element" or the "second locking element".

The administrative law judge finds that the description of the locking mechanisms along the long edges of the panels in claim 39 of the '267 patent to be even more deficient than that contained in claims 19 and 23 of said patent. No longer are the panels connected in the "second direction" so that the long sides can come into engagement by the action of the locking element being accommodated by the locking groove (as in claim 19) or by a first locking element being accommodated by a second locking element (as in claim 23), but instead by two locking members "engag[ing]" each other. Additionally, the description recited in claim 39 of the '267 patent contains the same deficiencies that were described with respect to the description recited in claim 19 except for the fact that the "first direction" is identified. However, there is still no description of the "second direction".[29]

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[28] From the language of claim 19, the locking element of claim 19 is accommodated in a locking groove while claim 23 does not even recite the presence of any "locking groove." Accordingly, claim 23 of the '267 patent falls within the scope of 35 U.S.C. § 112, ¶ 6.

[29] The "first direction" is described by claim 39 as being perpendicular to the principal plane of the first panel, which would, in the case of floor panels, make the "first direction" the vertical direction. Even if one were to assume that the "second direction" must then be the horizontal direction, the panels are capable of being shifted in two directions in the horizontal plane: along the joint edge or perpendicularly from the joint edge (i.e., when pushing the long edges together or pulling them apart). The administrative law judge finds that the claim language gives no

(b) Specification

Because the specification of the '267 patent is identical in substance to the specification of the '907 patent, the findings of the administrative law judge as to the specification of the '907 patent apply here.

(c) Development Of Inventions In Issue Including Related Applications

The '267 patent claimed priority to the same Swedish document as did the '907 patent. Also, as with '907 patent application, the application which resulted in the '267 patent is related to the application from which the '621 patent issued. Hence the findings of the administrative law judge under the '907 patent, as to said Swedish priority application, the PCT application, the application which resulted in the '621 patent and the development of the claimed invention, supra, apply to the '267 patent.[30]

(d) Conclusion

Based on the foregoing, the administrative law judge finds that 35 U.S.C. § 112, ¶ 6 applies to the claimed locking members and locking elements. He further finds that once those elements are construed under 35 U.S.C. § 112, ¶ 6, the

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indication as to which horizontal direction that the panels are to be connected in.

[30] In the prosecution of the '267 patent (FF 102-106), following an interview with the Examiner, dependent claims were rewritten, formal objections overcome and new claims added. The Examiner issued a notice of allowance on November 3, 1998.

disclosed structures that correspond to the locking means and locking members require play.

D. Each Asserted Claim Of The '907, '410 and '267 Patents Requires The Limitation Of Play In Addition To Having Play When Construed Under 35 U.S.C. § 112, ¶ 6

Complainants argued that the language of independent method claim 1 and dependent claims 2 and 3 and the specification of the '907 patent do not support reading a "play" limitation into said claims. (CPost at 20). The staff argued that the asserted claims do not require play. (SPost at 13).

Respondent Pergo argued that "[b]ased on the claim language, specification and prosecution histories of the patents in suit the claimed locking implements must be interpreted to require 'play'" and that play enables displacement. (RPPost at 2). It was argued that it does not matter if one calls any claim in issue a 35 U.S.C. § 112, ¶ 6 means plus function claim, as the terms in issue do not have a customary and ordinary meaning and one must go to the specification to define those terms anyway. (Tr. at 2339, 2488).

Respondent Unilin argued that the "asserted claims should be construed to cover a joint with play, because that is what Pervan invented and disclosed in his specification." (RUPost at 25). Roysol argued that "all of the asserted claims require play." (RRPost at 14). Respondent Akzenta also argued that "the Asserted Claims must be interpreted to require 'play'." (RAPost at 4).

In the foregoing, the administrative law judge has found that the specifications of each of the '907 patent, '410 patent

and the '267 patent explain that play is required to practice the claimed invention in issue. He has also found that said specifications disclose that play overcomes drawbacks in the prior art; that panels having play are the only panels disclosed in said specification; that the prosecution history confirms that the asserted claims of the three patents in issue require play; and that inventor Pervan designed non-play embodiments but affirmatively chose to exclude them from the PCT application on which the three patents in issue are based.

In addition, each of the asserted claims of the '410 patent recite a "locking means" (claims 1 and 26) or a "means for mechanically locking together" (claims 39 and 41) which consist, in part, of opposing "locking grooves" and "locking strips" with "locking elements". As stated above, the "locking means" and the "means for mechanically locking" are capable of forming two mechanical connections between adjacent floor panels: the horizontal direction perpendicular to the joint edge and the vertical direction. See, supra. The "locking means," while forming these two mechanical connections, also allows the panels to be rotated so that the locking element can leave the locking groove (claim 1) or can allow the panels to be released in an unspecified manner (claim 26). Claims 1 and 26 are ambiguous as to the locking means employed, because, inter alia, of the failure to disclose any structure relating to the first mechanical connection. See, supra. Accordingly, the specification must be examined to determine what is meant by "locking means" and the only embodiments that are described in the specification are edge locks with play. Similarly, the "means for mechanical locking" of claims 39 and 41 are capable of forming two mechanical connections, one in the horizontal direction perpendicular to the joint edge and the other in the vertical direction. The "means for mechanically locking" is designed so as to allow while engaged the turning of the panels

angularly so as to disengage the "locking element" and to allow displacement along the joint edge. Again no description of the structures needed to form the first mechanical connection are disclosed in the claims. See, supra. The specification reveals only "means for mechanically locking" in both the horizontal direction perpendicular to the joint edge and the vertical direction which include play.

Also, each of the asserted claims of the '907 patent and '267 patent recite methods of laying the floor panels to make a floor by angling and sliding the floor panel, wherein the panels have either a "locking groove," "locking member," or "locking element". As set forth supra, the specifications, prosecution histories of the patents in issue and development of the inventions teach that play is required to displace panels relative to one another when locked together. Every asserted claim of the '907 and '267 patents requires such displacement, thus confirming that the "locking groove," "locking member," and "locking element" of those claims must exhibit play. No method of installation of panels with locking implements lacking play is disclosed in said specification. Thus, in view of the unambiguous intrinsic evidence and the governing law of claim construction, the asserted method and composition of matter claims of the patents in issue must be construed to require play. The administrative law judge finds that the recent Federal Circuit case law cited by the parties supports this conclusion.

Thus in Watts the patents in issue were directed to joints and joint couplings for pipes used in oil wells. The claim language in dispute is underlined below:

> A high efficiency connection for joints of oilwell tubing or the like, comprising: at least two pipes joined together and forming joints of pipe, . . . the

> joints each having a second end formed with tapered external threads dimensioned such that one such joint may be sealingly connected directly with another such joint; . . .

The accused infringer argued that the "sealingly connected" term should be limited to such connections having only misaligned taper angles. The patentee contended that no such limitation appears in the claims, and therefore "sealingly connected" should not be limited to misaligned taper angles. The Court held that "sealingly connected" is limited to structures using misaligned taper angles. Watts, 232 F.3d at 885. It relied on the fact that "[t]he specification only describes one method in which 'tapered external threads [are] dimensioned' to achieve the sealing connection." Id. at 883. The Court first determined that the disputed terms were not clear on their face, and therefore the specification must be consulted to determine whether the patentee has defined any of those terms. Id. (citing Vitronics, 90 F.3d at 1582, 39 U.S.P.Q.2d at 1576). The specification in Watts limited the invention to structures that utilize misaligned taper angles by stating that the "present invention utilizes [the varying taper angle] feature." Moreover, the patentee argued in Watts that the specification was not limiting and that one of ordinary skill in the art would be aware of several ways to effect a sealing connection. "While this is true" the Court stated, "it does not overcome the fact that the specification specifies that the invention uses misaligned taper angles." Id. (citing O.I. Corp., 115 F.3d at 1581, 42 U.S.P.Q.2d at 1781; Wang Labs., Inc. v. Am. Online, Inc., 197 F.3d 1377, 1382-83, 53 U.S.P.Q.2d at 1161, 1164-65 (Fed. Cir. 1999); Modine Mfg. Co. v. United States Int'l Trade Comm'n, 75 F.3d 1545, 1551, 37 U.S.P.Q.2d 1609, 1612 (Fed. Cir. 1996)). The Court thus first determined that the specification did not explicitly discuss an embodiment without misaligned taper

angles and then reviewed the prosecution history of the claims.

The Court in Watts then reviewed the prosecution history of the claims, finding that the claims at issue were similarly limited in the prosecution history, in which the patentee distinguished the primary prior art reference based on the invention's misaligned taper angles, arguing that the reference taught away from using misaligned taper angles. Id. at 883. Though this argument was made in relation to another claim, the Court found it "irrelevant in this case whether Watts' prosecution history remarks were directed to [this claim] specifically because there is no clear indication that it is not." Id. (citing Southwall, 54 F.3d at 1579, 34 U.S.P.Q.2d at 1679). The Court further applied this argument in construing the claims of all three patents in suit because the common specification of the patents provided the same statements used by the Court to limit the claim to cover the only disclosed embodiment and the distinguishing remarks in the prosecution history applied to the asserted claim of a continuation-in-part (CIP) because the same limitation was present in the independent claim of that the CIP and the prosecution history of the CIP contained nothing to the contrary. Id. at 884. Similarly, the administrative law judge has found that the Pervan specification only describes one method - play - in which floor panel joints are dimensioned to achieve mutual displacement. Also Watts supports the use of the prosecution history of the Swedish application, the PCT application, and the 621 patent in construing the asserted claims of the three patents in issue.

In O.I. Corp., the patents in suit were directed to an apparatus and a method for removing water vapor from a sample. The sample was to be analyzed in a gas chromatograph, wherein the sample travels through a

"passage". The Federal Circuit determined that the disputed "passage" structures in this claim did not have an ordinary and accustomed meaning, and limited the term to the preferred embodiments set forth in the specification for several reasons. First, the specification described all of the passing structures as either being "non-smooth" or conical in shape. Second, the written description expressly distinguished over prior art passages by stating that the prior art passages are smooth-walled, whereas the present invention contemplates a number of geometries that have irregular shaped surfaces or noncylindrical shape. O.I. Corp., 115 F.3d at 1581. Thus, one skilled in the art, upon reading the specification, would have concluded that the term "passage," as used in the apparatus and method claims, does not encompass smooth-walled structures that are completely cylindrical, like the one used by the accused infringer. Also, the Court dismissed the patentee's argument that the construction of this language to exclude smooth-walled was improper under the doctrine of claim differentiation, noting that the construction of claims "is not based solely upon the language of other claims; the doctrine cannot alter a definition that is otherwise clear from the claim language, description, and prosecution history." Id. at 1582 (citing Hormone Research Found., 904 F.2d 1567 n.15, 15 U.S.P.Q 2d 1047 n.15). Thus, the clear language of the claims and the description provided a clear meaning of the disputed language of the claims, and trumped the doctrine of claim differentiation. Id.

In Toro Co., the claim construction dispute centered on whether the claims should be limited to a restriction ring permanently attached to an air inlet cover for a leaf blower. The following claim language was in dispute:

A convertible vacuum-blower comprising: . . .

> said cover including means for increasing the pressure [, i.e., a restriction ring,] developed by said vacuum-blower during operation as a blower when air is being supplied to said impeller through said apertured cover . . . .

Toro Co., 199 F.3d at 1298. The Court interpreted this clause to mean that the claims are limited to having restriction rings permanently attached to the cover. Though the claim language did not call out this limitation, the Court relied on the fact that "[t]he specification and drawings show the restriction rings as 'part of and permanently attached to the cover. No other structure is illustrated or described." Id. at 1301. Thus, the Court distinguished its narrow construction based on the only described invention from constructions that involve limiting claims to the preferred embodiment of an invention that has been more broadly disclosed and from constructions limiting the claim to immaterial details of a broader invention set forth in the specification. See SRI Int'l v. Matsushita Elec. Corp., 775 F.2d 1107, I 118, 227 U.S.P.Q. 577, 583 (Fed. Cir. 1985). Also, the patentee argued that the claim is entitled to a broader scope because a dependent claim which specifically recited the restriction ring as being carried by the cover, in contrast to the broader "including" language of the claim in dispute. The Court rejected this argument based on claim differentiation, noting that the doctrine "does not serve to broaden claims beyond their meaning in light of the specification . . . and does not override clear statements of scope in the specification and the prosecution history." Toro, 199 F.3d at 1302 (citations omitted). Similarly, the Pervan patent specification and the drawings therein show play as part of the space between the locking element and locking groove. Cf. Toro, 199 F.3d at 1301 ("Nowhere in the specification, including its twenty-one drawings, is the cover shown without the restriction ring attached to it.")

In Cultor Corp. v. A.E. Staley Mfg. Co., 224 F.3d 1328 (Fed. Cir. 2000), the claim language referred broadly to dissolving polydextrose in water. The specification disclosed that the water-soluble polydextrose contemplated by the invention was polydetrose "prepared using a citric acid catalyst." Id. at 1331. Despite claim language broadly directed to "polydextrose", the Court found that this statement in the specification required the claims to be limited to polydextrose prepared with citric acid and "effected" a disclaimer of the other prior art acids." Id.

In Oak Tech., Inc. v. U.S. Int'l Trade Comm'n, 248 F.3d 1316 (Fed. Cir. 2001), the claim limitation in dispute was the term "said assembled data". The patentee asserted that the term simply refers to data on the CD-ROM that is sent from the CD-ROM drive to the controller one bit at a time and does not refer to any particular amount of data. In support of its claim construction the patentee pointed to a portion of the specification that disclosed assembled data without specifying any particular amount of data. See Id. at 1326-27. The accused infringer argued that the term should be limited to assembled data that represents an entire sector of data. The Court agreed with the accused infringer's argument and found that the term "said assembled data" was limited to data in amounts of 2048 bytes.

The invention described and claimed in the patent related to an improved CD-ROM drive controller which provided faster and simplified data communication. The dispute centered around whether the accused devices met the limitations of claim 1 that required "performing error correction on said assembled data and . . . detecting errors in said assembled data after correction of said data by said correction circuitry." The Court noted that the plain language of the claim explicitly described a sequential process: The

"assembled data" is processed by the "error correction circuitry" and converted into "corrected assembled data," and the claim specified that the cyclic redundancy checker operates on the output of the "error correction circuitry." Id. at 1325. The Court recognized that one of ordinary skill in the art would know that assembled data could mean less than a full sector for purposes of error correction and error detection, but found that the patentee had provided an alternative definition in the specification. Id. at 1326. The Court relied on the fact that "the only embodiment described" in the patent specification was one where data was organized into "pages" of memory having 2048 bytes of data. See id. at 1327. The Court rejected plaintiff's argument that this construction amounted to an impermissible importation of limitations from the preferred embodiment into the claims, because the sequential limitation was imposed by the claim language itself, while the written description simply confirmed that the Court's interpretation was proper. Id. at 1328-29. ("There is no discussion anywhere in the intrinsic record of embodiments of 'error detection and correction means' which do not operate in a straightforward sequential manner.")[31]

In SciMed Life Systems, Inc. v. Advanced Cardiovascular Systems, Inc., 242 F.3d 1337, 58 U.S.P.Q.2d 1059 (Fed. Cir. 2001) the Court held that the common specification of the

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[31] Also, the meaning of the term "after" was in issue, and the plaintiff argued that the claimed "cyclic redundancy checker[s]" should be interpreted to cover any circuitry that performs a cyclic redundancy check. The Court, however, determined that the claim only covers "cyclic redundancy checker[s]" that operate on the sector of assembled data after the sector has been processed by the "error correction circuitry", due to the use of "after" in the claim language, thus connoting a sequence of events. Id. at 1329-30.

three patents at issue expressly limited the recited "lumen" structures in the claimed catheters to coaxial lumens, finding that the applicant disclaimed the alternate distal lumen structure in the written description. The specification described the coaxial structure as the "basic sleeve structure for all embodiments of the present invention contemplated and disclosed herein." Id. at 1339. The district court and the Federal Circuit read this language as evidencing an intention to disclaim the alternative dual lumen or side-by-side structure practiced by the accused party. Also, the alternative dual lumen structure was discussed in the specification with disfavor, as having disadvantages not found with the coaxial lumen, Id. at 1342-43. The Court found that this discussion supported the district court's conclusion that the claims should not be read so as to encompass the distinguished prior art structure. Id. at 1343 (citing Tronzo v. Biomet, Inc., 156 F.3d 1154, 1159, U.S.P.Q.2d 1829, 1833 (Fed. Cir. 1998)). There was nothing pertinent to the claim construction issue in the prosecution history.

In SciMed, the Court rejected the plaintiff's argument that the district court had read a limitation from the written description into the claim, finding that the lower court had simply read the claims in light of the teachings of the specification as required by Markman. "Where the specification makes clear that the invention does not include a particular feature" the court stated, "that feature is outside of the scope of the claims of the patent." SciMed., 242 F.3d at 1343-44. Though there was broad claim language related to the lumen embodiments that on its face could have been read to encompass more embodiments than were disclosed by the specification, the Court determined that the specification limited the scope that the claim was entitled to. Read together, those portions of the common specification led the Court to conclude that the references in the asserted claims to an

inflation lumen "separate from" the guide wire lumen must be understood as referring to coaxial lumens, and thus the asserted claims therefore did not read on the accused device which uses a distal lumen structure.

In Wang Labs., the Court found that the patentee had defined a "frame" in the claims, which are directed towards a system for providing computer users with information from remote computer databases, as limited to character-based systems though the ordinary meaning of the term would include both character-based and bit-mapped display systems. The Court found that the only system described and enabled was character-based and any references to bit-mapped systems did not describe these systems as part of the present invention. Like the dual lumen structure in SciMed, at the time the invention claimed in patent in issue in Wang was conceived, both bit-map and character-based protocols were commonplace and known in the art. Both parties agreed that the ordinary meaning of the term "frame" included both protocols. However, the specification described the claimed system as storing "alphanumeric and graphic characters," and all other references to the system also used the term "characters." Additionally, one of the patent figures which depicted a software flow chart showed only character-based protocols. Thus, the Court concluded that the only system described and enabled in the specification and drawings was one that used character-based protocols. Other protocols were mentioned in the background section of the patent at issue. However, both the district court and Federal Circuit determined that those references to other protocols were acknowledgments of the state of the prior art, not of potential alternative embodiments. The Court held that the claimed system in Wang could not utilize bit-map protocols, and the Court accordingly held that inclusion of those protocols within the scope of the construed claims would violate the

enablement requirement of § 112, ¶ 1. The Court stated that when the preferred embodiment is described as the invention itself, the claims are not entitled to a scope beyond the preferred embodiment.

The prosecution history also supported the limitation of frame to character-based protocols in Wang. An information disclosure statement (IDS) was submitted distinguishing a reference on the basis that the reference did not encode information on the character level. Though this information was filed in a parent application, from which the patent in issue in Wang issued from a CIP applications, the subject matter cited was common to the two applications, so the IDS was deemed part of the relevant prosecution history of the patent in issue in Wang. Finally, the claims construed under § 112, ¶ 6 were limited to character-based structures, as the only structures described in the specification. Bit-map systems were found to be not equivalent under § 112, ¶ 6 to the disclosed character-based structures because of the argument in the parent file history that these protocols were different and the patentee's inability to implement the system using bit-map structures prior to filing the application.

Complainants cited Gart for the assertion that the claims-at-issue should not be read to require "play." In Gart, the Federal Circuit held that the district court construed the single claim at issue, which related to ergonomically shaped computer mouses that reduce muscle fatigue, as having the limitation of an "angular medial surface" that included a "ledge." It was not clear to the court whether the lower court construed the "angular ledge" to include a concave depression or curved undercut area to support the fingers in an enclosed or folded configuration, however, the Court stated that it would also be improper to read a "concave depression" limitation into the asserted claim.

The claim language at issue in Gart simply recited "an angular medial surface for supporting the three remaining fingers in a wrapped configuration with flexion of the distal, middle, and proximal phalanges of the ulnar fingers." Gart, 59 U.S.P.Q.2d at 1292 (quoting '165 patent, col. 8, ll. 40-47) (emphasis added). The specification contained three drawings that included a ledge and undercut area to support the fingers while wrapped around the mouse. Also, the applicant distinguished three prior art references, stating that the references fail to set forth an undercut area for the fingers to rest. Additionally, the examiner's reasons for allowance stated that the prior art failed to teach the "details of the shapes and surfaces" taught by the claims. Finally, the written description described a "medial ledge undercut," and this ledge was not defined as a preferred embodiment. The Court determined that given the facts of this case, it would be improper to limit the claim at issue to cover only embodiments with an angular ledge because the written description "does not explicitly limit the subject matter of the patent to the ledge configuration set forth in the drawings." Id. at 1295. The district court's construction improperly imported a limitation appearing in the specification and the drawings which did not appear in the unambiguous language of the claim. The Court then determined that the specification simply exemplifies one embodiment of the invention that would be comfortable for the user of the ergonomic mouse. Additionally, though the prior art was distinguished because it did not include the "undercut curved areas," there were other bases on the record for distinguishing the prior art. Finally, the examiner did not state that the patentable difference over the prior art was the concave undercut area, and the court stated that drawing inferences from an examiner's silence is not a proper basis for construing a claim. Id. at 1296.

Therefore, Gart is distinguishable from this case for several reasons. In Gart, the Court found that the district court was importing limitations from the specification into the claims because "the written description does not explicitly limit the subject matter of the patent to the ledge configuration set forth in the drawings." Id. at 1295. However, the written description may provide an explicit or implicit definition of the terms set forth in the claims, "thereby dictating the manner in which the claims are to be construed, even if the guidance is not provided in explicit definitional format." Bell Atlantic, 59 U.S.P.Q.2d at 1870 (quoting SciMed, 242 F.3d at 1344, 58 U.S.P.Q.2d at 1065). In this investigation, the administrative law judge has found that "play" is an implicit limitation provided in the written description, which is part of the definition of the claim terms such as "locking element," "locking member," "locking strip," and "locking groove" set forth in the specification. Those elements exhibit play when in the locked position, as shown and described throughout the written description of the three patents in issue. Thus, said claim terms are being interpreted in light of the teachings of Watts, SciMed, Cultor, and Wang, where the disputed terms or limitations were construed to be no broader than the teachings of the specification.

Moreover, the prosecution history of the '621 patent, which is parent to the patents in issue and in which prior art locking flooring systems and methods were distinguished based on the fact that they do not have play, further supports this result. See O.I. Corp., 115 F.3d at 1581 (holding that where the written description expressly distinguished over prior art passages by stating that the prior art passages are smooth-walled, whereas the present invention contemplates a number of geometries that have irregular shaped surfaces or noncylindrical shape, the patentee will has disclaimed smooth-wall passages); SciMed, 242 F.3d at 1343 (holding that claims

should not be read so as to encompass the distinguished prior art structure); Tronzo, 156 F.3d at 1159.

Complainants argued that the doctrine of claim differentiation, referring to dependent claim 49 of the '610 patent, applies so as to preclude a construction of the asserted claims to include play. However the doctrine of claim differentiation may not be used to overcome the clear meaning of the disputed claim terms provided in the specification and the prosecution history,[32] and here the terms are implicitly defined in the specification and the prosecution history as having play.

The administrative law judge finds that the above cases are fully consistent with his interpretation of the claims in issue as requiring the specific limitation of "play" which has been described by the specification and the prosecution history of the patents in issue as being critical to the practice of the invention, including enabling specific objects of the invention directed to displacement.

VI. Infringement

A. Direct Infringement

1. The '907 Patent

Complainants have argued that even with the administrative law judge's construction of the asserted claims at issue - i.e., all of the asserted claims require play between the locking element and the locking surface - that the Unilin, Pergo and Akzenta products still infringe the asserted claims

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[32] See Section V B (c) supra.

of the '907 patents because the joints of those accused products from those respondents contain play. (See CPost at 50-53). Unilin, Pergo and Akzenta have claimed that their products do not have such play. Complainants have the burden of proving infringement by a preponderance of the evidence, Certain Variable Speed Wind Turbines, Inv. No. 337-TA-376, Initial Determination at 58 (May 30, 1996), and hence they have the burden of proving that each of the Unilin, Pergo and Akzenta products have therequisite play for each claim in issue. Certain Excimer Laser Systems, 337-TA-419, Comm'n Op. at 14 (April 14, 2000).

(a) Unilin

Complainants' allegation that the Unilin product has the requisite play is based on the analysis of their expert, Limbert, of the drawing shown in the document numbered U12971 in RX-2131, which is a drawing of the Unilin joint for the tool makers to make the tools that are used to make the Uniclic joint for the long side of Unilin's 8.0 millimeter panels. (Thiers, Tr. at 1437-1443; RX-2131 at U12971). Limbert, relying on the depiction of the long side of the Uniclic joint contained in this series of drawings, performed a series of calculations regarding whether an interference or a clearance existed between the surfaces of the locking groove and the locking element for the Unilin panels when they are connected with the upper corner portions abutted and in plane. (Limbert Tr. at 879-80; CX-209). Limbert used the second page of CX-1583 (U12971) as the basis for his analysis of the geometry of the Unilin joint profile. (Limbert Tr. at 1154). Limbert's analysis of the Unilin 8.0 millimeter panels revealed that when the long side of the panels are connected and are in a plane with their upper corner portions abutted, there is a clearance of 0.007 or 0.014 millimeters between the locking surface of the groove and the locking surface of the

locking element that fits into that groove. (Limbert Tr. at 879-80; CX-209).

The administrative law judge rejects Limbert's analysis because the record shows that Limbert assumed that the engineering drawings upon which he based his work were drawings of the Uniclic joint as it actually exists, when, in fact, these were drawings of the joint for the purpose of making the tools that are used to make the Uniclic joint. (Thiers, Tr. at 1437-43; Loferski, Tr. at 1369-73; RX-2131 at U12971). The actual dimensions of the joint differ from those of the tool drawings for four reasons. (Thiers, Tr. at 1437-43; Loferski, Tr. at 1369-73; RX-2131 at U12971). First, the relative positioning of the tools in the cutting machine is subject to adjustment, resulting in a product profile different from that which is represented by the tool drawings. (Thiers, Tr. at 1437-43; Loferski, Tr. at 1369-73; RX-2131 at U12971). Second, the medium density fiberboard (MDF) used in making the panels is a wood based material that reacts to being cut by springing back. (Thiers, Tr. at 1437-43; Loferski, Tr. at 1369-73; RX-2131 at U12971). Third, cutting the MDF draws fibers to the surface of the board. (Thiers, Tr. at 1437-43; Loferski, Tr. at 1369-73; RX-2131 at U12971). Fourth, a layer of paraffin is applied to the joint during the production process. (Thiers, Tr. at 1437-43; Loferski, Tr. at 1369-73; RX-2131 at U12971).[33]

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[33] During complainants' rebuttal case Limbert attempted to defend his use of the drawings in RX-213 testifying, concerning Thiers' earlier testimony that the drawings were not of the joint but of the tools used to make the joint:

[Complainants' Counsel]:

Did that testimony give any relation to the opinions

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or analysis that you have done in connection with the Uniclic product?

A Yes, it does.

Q Could you explain to the Court the connection?

A After the Uniclic product is produced on some regular basis, it goes through not only the subjective hand test that Mr. Thiers discussed, but at another level, and I don't recall how often this is done, but panels from the boxes are measured using a coordinate measuring machine.

And in some of the documents that I've been provided, there are drawings of the Uniclic product with that call out the [quality control] measurements that are done by either Unilin or for the Uniclic product.

Those drawings are the same as the drawings that I have been provided except that with regard to their dimensions, except that they illustrate these other measurements that are done for . . . [quality control] purposes.

So therefore, the drawings are not just a representation for tooling purposes as was suggested in some earlier testimony, but the dimensions on those drawings are really what make up the measurements that are done on the product after it's produced. [Emphasis added]

However, Limbert failed to identify the drawings that he had been provided that illustrated the measurements that are done for quality control purposes and which he testified as being identical to the drawings contained in RX-2131. Hence, what those drawings were are unknown to the administrative law judge and were not identified by Limbert during rebuttal cross examination by respondents.

Furthermore, even if the drawings contained in RX-2131 were correct depictions of the Unilin product's joint as it exists, Limbert's analysis would still be rejected as flawed, as his calculations were mathematically incorrect for three reasons. (Limbert, Tr. at 2136-47; CX-209). First, although Limbert based his calculations on drawings where the measurements were carried to one or two digits to the right of a decimal point, Limbert carried his answers to three digits to the right. (Limbert, Tr. at 2136-47; CX-209). Second, Limbert assumed the existence of an ideal surface. (Limbert, Tr. at 2136-47; CX-209).[34] Third, Limbert's work contained basic errors in algebra. For example, at page 5 of his calculations Limbert incorrectly reaches a figure of negative 11.715, instead of negative 11.713. This is particularly significant in view of his testimony that even small alternations in the numbers used in the calculations can have a disproportionate impact on the final result. (Limbert, Tr. at 2136-47; CX-209).

In contrast to Limbert's theoretical work, Unilin's expert, Loferski, actually tested the Unilin panels for play, including testing Uniclic panels for the presence of play using a universal testing machine at the Unilin factory in Belgium. (Loferski, Tr. at 1575-76; Thiers, Tr. at 1432). Although Loferski performed the test approximately six to eight times, he never found play in any of the Quick-Step Uniclic panels so tested. (Loferski, Tr. at 1575-76; Thiers, Tr. at 1432).

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[34] This is in particular contrast to Limbert's testimony concerning ideal planes, in which he stated that "as an engineer, I have a concept of an ideal plane, and in mathematics we work with that concept a lot. When you are dealing with practical problems you deal with non-ideal planes that we all experience every day. The floor in this courtroom is a plane but it is not a mathematically ideal plane." (Limbert, Tr. at 657-58).

Loferski also examined small samples of the Unilin product in order to determine whether or not there was any play. (Loferski, Tr. at 1572). Loferski described this test and his results accordingly:

> I assembled them with my hands. I examined them. I tried to displace them. I pulled them apart. When I pulled them apart - I have small samples of them and I pulled them apart a little bit when I create enough displacement so that a small gap occurs between the top surface of the two panels and I release the panels, they spring back together, the gap closes, and this tells me that there is pretension in this joint, that there is no play.

(Loferksi, Tr. at 1572).

Accordingly, the administrative law judge finds that complainants have failed to meet their burden in proving that the accused Unilin products have the necessary play. As such, the administrative law judge finds that complainants have not established that the accused Unilin products infringe the asserted claims of the '907 patent.

(b) Pergo

Complainants claimed that the accused Pergo products had play and therefore infringed the asserted claims of the '907 patent even under the administrative law judge's construction of those patents as requiring play. However, complainants' sole basis for asserting that the Pergo products contained play is that the joint used in the Pergo products was identical to that used in the accused Unilin products. Complainanls cited no additional evidence than what they had cited to in support of their contention that the Unilin products had play.

Therefore, for the same reasons that the administrative law judge rejected complainants' arguments with respect to the Unilin product, the administrative law judge rejects those arguments in connection with the accused Pergo products and finds that complainants did not meet their burden of proof in proving that the accused Pergo products did not have play. Accordingly, in light of complainants' failure to prove that the accused Pergo products have the play required for them to practice the asserted claims of all three patents, the administrative law judge finds that complainants have not established that the Pergo products in issue infringe any of the asserted claims of the '907 patents.

(e) Roysol

Complainants did not raise any arguments or cite to any evidence showing that the accused Roysol products had play. (See CPost at 53-56). Therefore, the administrative law judge finds that complainants have not met their burden of proof in proving that the accused Roysol products have play. Accordingly, in light of complainants' failure to prove that the accused Roysol products have the play required for them to practice the asserted claims of the '907 patent, the administrative law judge finds that the Roysol products in issue do not infringe any of the asserted claims of the '907 patent.

(d) Akzenta

The design of the Akzenta product is a line-to-line design and is designed to have no interference between and no separation between surfaces when the product is in its assembled and locked condition. (Limbert, Tr. at 875-76). As a line-to-line design, the Akzenta joint is constructed so that it has no separation between the locking element and the

surface with which it comes in contact when the Akzenta panels are assembled and in their locked position. (Limbert, Tr. at 875-76). When the specifications for the new Akzenta design were set, there was intended to be no space between the tongue and groove portions of the mechanical. (JX-3 at 24-28; RX-3040). The design specifications call for an exact fit between the tongue portion and the groove portion of the flooring products with no space whatsoever between them. (JX-3 at 23; Limbert, Tr. at 875-76). Accordingly, the locking element used in the Akzenta product should be exactly the same size as the locking groove. (Id.) If the locking element is smaller than the locking groove, then play will exist. Id. If the locking element is larger than the locking groove, then interference will exist. However, complainants argued that even though the accused Akzenta products are designed not to have play, the Akzenta milling tolerances are $\pm$0.03 millimeters, and because of these milling tolerances, the locking element of Akzenta's product can be up to 0.03 millimeters smaller than designed while the locking groove can be up to 0.03 millimeters larger than designed, thus creating a potential for a play of 0.06 millimeters to exist in the Akzenta product. (Limbert, Tr. at 875-76).

The milling tolerance of the machines used to make the locking element and locking groove for the accused Akzenta product have a theoretical manufacturing tolerance of plus or minus 0.03 millimeters. (JX-3 at 59-61, 69-70; RX-3014 at AK 13608). That milling tolerance is the maximum deviation allowed under a "Factory Supply Agreement" entered into by Akzenta, under which Akzenta received a "Quality Guarantee" and a "Tolerance Guarantee" that the equipment used to manufacture the accused Akzenta product would be able to make the "Tongue/groove offset" within "+ −0.030 mm/marked by hand/." (RX-3014 at AK13608).

Additionally, at least every ten minutes during a production run, Akzenta checks the product being produced, using several different measuring devices to make sure that the profile of its product comes within the milling tolerances. (JX-3 at 61-64). Akzenta continuously monitors the entire length of the edges of the panels where the tongue contacts the lower groove edge. (JX-3 at 68-69). Akzenta performs constant quality control checks to determine trends. (JX-3 at 68-69). By understanding these trends, Akzenta can undertake appropriate corrective action. Product that does not meet specification and fall within acceptable tolerances is not sold. (JX-3 at 68-69). The milling tolerance of $\pm$.03 mm is a minimum standard, as the actual tolerances of the machines used to make the floor panels are actually much better than $\pm$.03 millimeters. (JX-3 at 67). Complainants introduced no evidence concerning the actual deviation found in the Akzenta product from the specifications. The $\pm$.03 millimeters milling tolerance is simply the range for acceptable deviation in the actual Akzenta product. (JX-3 at 59-64). While a deviation of .03 millimeters comes within this range, so does a deviation of zero.

Furthermore, the manufacturing tolerances are just as likely to cause an interference at a random point on a joint edge as they are to cause a separation at a random point on a joint edge. (Limbert Tr. at 1102-03). In fact, milling tolerances may cause a separation at one point on an edge while causing interferences at other points along the same edge. (Limbert, Tr. at 1103).

Additionally, tolerances within the processed wood that is used in the manufacture of the Akzenta product can in and of themselves cause a very small pressure or at least contact between two surfaces along the profile. (JX-3 at 66). These tolerances within the material itself are another reason why

quality control checks are made every ten minutes during production. (JX-3 at 67). The tolerance of the machine is actually much better than .03 millimeters, but Akzenta also has to take into consideration the tolerances of the material itself. (JX-3 at 67). That is typical for this type of high-density fiber material, which is not perfectly flat because of changes in temperature and humidity which cause the high-density fiber material to change. (JX-3 at 66-67). Such changes can cause a very small pressure or an absence of pressure between two surfaces along the profile. (JX-3 at 66-67).

Dr. Scott Bair, a Principal Research Engineer at the Georgia Institute of Technology, has confirmed the absence of play in the Akzenta product. (Bair, Tr. at 2001-03). Bair's physical inspection of multiple samples of the Akzenta panels revealed no space between the locking element of the Akzenta panels and the surface with which it comes into contact. (Bair, Tr. at 2001).

The administrative law judge rejects complainants' arguments that the accused Akzenta products have play. The arguments that complainants advanced in their post-hearing submissions are the same that were summarized by Limbert in the following testimony:

> Q Dr. Limbert, if the claims are interpreted to require play, would the Akzenta products still be covered by the claims?
>
> A Yes, they would.
>
> Q Can you explain the basis for that opinion?

A We've done an analysis of the Akzenta drawings, and they tell us that the nominal design of the Akzenta product is a line-to-line design, that is, that the nominal product, without any tolerances, would have no interference and no separation of surfaces when the product is in its assembled and locked condition.

However, the deposition of, I believe it was a Mr. Eiserman, told us that the Akzenta tolerances are, I think my number, my recollection is plus or minus 0.03 millimeters along the - in the geometry of the Akzenta joint, and what that tells me is that they will make some products that have that clearance between the locking surface and they will make some products that has interference between those surfaces.

So it is -- it is my opinion that there is Tarkett product that has play.

JUDGE LUCKERN: Let me just ask you a question and then you started out your answer, "we've done an analysis."

"We've," I take it that's Complainants, whoever, "we've done an analysis," maybe you could tell me what you meant, by who you mean by "we" and then you say "we've done an analysis of the Akzenta drawings drawing and they tell us," and I'm wondering what you had in mind when you said "they tell us," and who's "we," that's all. You don't repeat yourself, just whatever. I want to make sure this is crystal clear.

THE WITNESS: I'm sorry.

JUDGE LUCKERN: I'm not being critical, under a lot of pressure and not doing any -- go ahead.

THE WITNESS: By "we," I meant me and some other people on our staff in the Phoenix office, that's what we refer to, me and other engineers did that analysis.

JUDGE LUCKERN: And who is "they," and they tell us –

THE WITNESS: And "they tell us," the antecedent of that pronoun were or are the Akzenta drawings.

Tr. at 875-77 (Emphasis added).

Limbert so maintained this position, despite admitting during cross-examination that the same milling tolerances that he relied upon as a basis for asserting that the Akzenta product had play are as equally likely to result in the exact opposite of play, viz. interference. (Tr. at 1102-03). Limbert also admitted that while the milling tolerances could result in play at one point of the joint edge, they could at another point on the same edge result in interference. (Tr. at 1102-03). Although, Limbert later asserted that, despite the fact that the milling tolerances that he was relying on could result in a joint edge with interference, or a joint edge where interference existed at certain points and where play existed at other points, the milling tolerances could result in a joint which had play along the entire length of the joint, he did not attempt to quantify the likelihood of such an occurrence through statistical analysis. (Tr. at 1102-03).

Furthermore, it is clear from the record that Limbert assumed that the milling tolerance of $\pm .03$ millimeters was

the actual deviation found in the production of the Akzenta product. This is despite the fact that the basis for Limbert's adoption of this number was Eiserman's deposition (JX-3), (Tr. at 875-77), in which Eiserman stated that although the milling tolerance was ±.03 millimeters, the actual tolerance was much lower. (JX-3 at 67). Finally, complainants have not produced one test which has found play to exist in any of the accused Akzenta products.

Accordingly, the administrative law judge finds that complainants have failed to meet their burden of proving that the accused Akzenta products have the necessary play. As such, the administrative law judge finds that complainants have not established that the accused Akzenta products infringe the asserted claims of the '907 patent.

2. The '410 And '267 Patents

In view of the findings of the administrative law judge that (1) the claimed edge lock and flooring system in issue in the '410 patent and the claimed methods in issue in the '267 patent must be construed as involving a mechanical joint with play and (2) the accused products do not involve play, the administrative law judge finds that complainants have not established that the accused products in issue infringe the asserted claims of the '410 and '267 patents.

B. Induced And Contributory Infringement Of The '907 and '267 Patents

Complainants argued that before June 2000, Unilin, BHK and Meister-Leisten were made aware that their methods of installation infringed the method patents in issue, but yet they still presently disseminate instructions which clearly guide customers to install Uniclic panels in ways which result in

infringement of both the '907 and '267 method patents. (CPost at 86). It was argued that Pergo was made aware of both the '267 and '907 patents well before June 2000, and that under the name Presto, Pergo sells the Uniclic brand of mechanically locking flooring panels; and that sales of the Presto product in recent years have been substantial. (CPost at 87). Complainants argued that Akzenta have made substantial sales of its infringing products, despite having been aware of its infringement of the method patents in issue, and like the other respondents Akzenta has not put forth any evidence that would rebut the testimony that the only way to install its glueless panels is by the methods of the asserted claims of the '267 and '907 patents. (CPost at 89). It was argued that Roysol induces infringement of, and that the customers that install the Snap Floor panels of Roysol contributorily infringe, the asserted claims of the '907 patent and the '267 patent; that Roysol's instructions, which Roysol intends its customers to follow, clearly show that the method of installation of the Snap Floor panels infringe claims 1-3 of the '907 patent; that Limbert has also demonstrated the ability of Roysol's product to be installed using the methods of the asserted claims of the '267 patent; and that the methods disclosed in asserted claims of the '267 and '907 patents are the only practical ways of installing a floor using the mechanical locking panels at issue in this case. (CPost at 90).

The staff argued that respondents contributorily infringe the '907 and '267 patent and induce the infringement of said patents. (SPost at 25-28).

Respondents have denied that they contributory infringe or induce infringement of the asserted claims of the '907 and '267 patents.

In order to show that an accused party induces infringement, there must be proof of direct infringement by another. "[T]here can be no inducement of infringement... in the absence of direct infringement." Standards Havens Prods., Inc., v. Gencor Indus., Inc., 953 F.2d 1360, 1374 (Fed. Cir. 1991), cert denied, 506 U.S. 817 (1992). "In the absence of direct infringement, [a person] cannot be liable for inducing infringement under § 271 (b)." Moleculon Research Corp. v. CBS, Inc., 872 F.2d 407 410 (Fed. Cir. 1987); see also Arthur A. Collins, Inc. v. Northern Telecom, Ltd. 216 F.3d 1042, 1048 (Fed. Cir. 2000) ("To establish [an accused infringer's] liability for inducing infringement, [a patentee] must show a direct infringement of the... patents [in suit]."). Moreover, as with induced infringement, there is no liability for contributory infringement in the absence of direct infringement by a third-party. "Absent direct infringement of the claims of patent, there can be neither contributory infringement nor inducement of infringement." Carborundum Co. v. Molten Metals Equipment Innovations, Inc., 72 F.3d 872, 876 n.4 (Fed. Cir. 1995). The administrative law judge has found no direct infringement by any of the accused products. Hence he finds that complainants have not established any contributory infringement or induced infringement of the '907 and '267 patents.

Assuming there was direct infringement in that respondents' accused products showed play, section 271 (b) provides that "[w]hoever actively induces infringement of a patent shall be liable as an infringer." However it must be established that the accused infringer possessed specific intent to encourage another's infringement and not merely that the accused infringer had knowledge of the acts alleged to constitute inducement. Also, complainants have the burden of showing that the alleged infringer's actions induced infringing acts and that it knew or should have known its actions would

induce actual infringements. Manville Sales Corp. v. Paramount Systems, Inc., 917 F.2d 544, 553 (Fed. Cir. 1990).

Unilin has been in the laminate flooring business since 1989. (Thiers, Tr. at 1416, 1420). As an industry player, Unilin regularly participates in trade shows. The most important of those is the Domotex show, which is held in Hanover, Germany. (Thiers, Tr. at 1417). Unilin had a booth at the Domotex trade show in 1996. (Thiers, Tr. at 1418). A few months after Domotex 1996, Unilin launched a project to develop a new kind of mechanically locking laminate flooring. (Thiers, Tr. at 1422). Bernard Thiers was in charge of the project. (Thiers, Tr. at 1423). The goal of the project was to "make a joint, without play, milled directly out of the MDF" and to develop a product "completely different" from past developments and to make sure Unilin had "a very tight contact." (Thiers, Tr. at 1422, 1423, 1521). Unilin's first prototype was never commercialized. (Thiers, Tr. at 1426). In the spring of 1997, a solution was found which sidestepped the problems of maintaining zero-play and zero-play was abandoned in favor of a product with pretension, i.e., a joint design that ensures the edges of the panels are pressed (or biased) against each other. (Thiers, Tr. at 1427). Unilin commercially introduced the product with pretension in October 1997. (Thiers, Tr. at 1431). The market reaction to the product was immediately very positive. (Thiers, Tr. at 1432). The commercial name of the joint is "Uniclic". The commercial name of Unilin's floor panel product is Quick-Step. (Thiers, Tr. at 1432). Licensed products incorporating the Uniclic technology are also sold under other brand names including, inter alia, Pergo Presto, Meister Leisten Tongue and Groove Snap, Meister Leisten Moderna, Meister Leisten Prestige Systema Silence, and BHK of America's Quick-Step. (Lofeski. Tr. at 1382; JX-9 at 45-46; JX-8 at 26).

Complainant argued that Unilin was put on notice as early as January 1997 of the potential for conflict between the Uniclic product and Välinge's patent rights. (CFF 1920). However, Unilin in March 1997 came to the conclusion that its product was completely different from what was claimed in the Välinge patents and has patented its product. (See CX-1579).[35]

Referring to respondent Roysol, complainants acknowledged that Roysol claims it is incapable of infringing because of the "unique design" of Roysol's Snap Floor product. (See CRRFF126C). Respondent Akzenta had been advised that the Pervan patents would likely not withstand opposition; that the Terbrack patent invalidated the Pervan patents; and that Akzenta's floor panels and method of installation do not infringe the Pervan patents. (See RX-3016, RX-3020 and RX-3021).

Based on the foregoing, assuming direct infringement has been established regarding any respondents, which it has not, the administrative law judge finds that complainants have not established a specific intent by each of the respondents to cause another to infringe and hence finds no induced infringement.

Referring to complainants' allegation of contributory infringement complainants argued that there are only two ways by which to install a floor with the mechanically locking flooring products at issue in this investigation, viz., the

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[35] Unilin has initiated an infringement suit in the U.S. District Court for the District of Columbia to enforce U.S. Pat. No. 6,006,486 against complainants. See Order No. 26 at 4.

method of the '267 patent ("angle-slide-snap") and the method of the '907 patent ("angle-slide-angle"). (CPost at 86).

Under the express terms of § 271(c), liability for contributory infringement cannot be predicated on importation or sale of a product that is "a staple article of commerce suitable for substantial noninfringing use." Id.; see C. R. Bard Inc. v. Advanced Cardiovascular Systems, Inc., 911 F.2d 670, 674-75 (Fed. Cir. 1990); Universal Electronics, Inc. v. Zenith Electronics Corp., 846 F.Supp. 641, 651-52 (N.D. Ill.), aff'd, 41 F.3d. 1520 (Fed. Cir. 1994).

Morever the record establishes that there are many ways to install Pergo Presto panels other than the methods claimed in the '907 and '267 patents. (Wennerth, Tr. at 517-520; Limbert, Tr. at 897-899, 1030-1031; JX-54 at 783-785). Thus Mr. Wennerth admitted that one non-infringing way to install Pergo Presto is the "slide-slide" method described in Pergo's installation instructions. (Wennerth, Tr. at 517-520). {

} Also while complainants argued that a June 21, 2000 letter from legal counsel for respondent Akzenta to Claus Wennerth describes the methods of installation of the Akzenta mechanically-locking flooring product as the angle-slide-angle and the angle-slide-snap methods (CFF 2022) the June 21, 2000 letter describes {

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In addition complainants' expert Limbert testified (Tr. at 897 to 899):

> Q Sure. You've talked about two different methods of installation, and we used some shorthand. One of them you referred to as the "angle-displace-

angle" and the other one, the "angle-slide-snap." Do you recall that?

A Yes, I do.

Q Now those aren't the only two ways to install floor paneling, correct?

A I believe there are other ways to install floor panels, yes.

Q Indeed there are many ways, correct?

A That's probably a fair statement, yes.

Q We can do the snap-snap method, are you familiar with that?

A Well, just to be sure that we're speaking the same language, Mr. DiMatteo, by "snap-snap," are you referring to an in-plane assembly procedure in which one assembles one set of edges in plane and then displaces that panel in plane to connect the other set of edges?

Q Exactly.

A Then yes.

* * *

Q We could put a whole row in using the angle on the short side; you understand what I'm referring to?

A Yes.

Q And then I can take another row, angle on the short side, you understand me so far?

A I think so.

Q And then I could take that whole row and angle it into the first row, correct?

A Well, you could try, yes.

Q That's one way. I could also snap that row in?

A Yes.

Q And then there are many different combinations between snapping and angling you can envision in installing an entire floor, correct?

A And I presume we're talking about panels with mechanical locking systems along the edges?

Q Yes.

A Yes.

Q Now, I listened very carefully during your direct testimony and I didn't hear any testimony on your direct about how my client Meister-Leisten instructs its purchasers on how to install floor panels, correct?

A Well, I don't know what you heard.

Q You offered no direct testimony on the Meister-Leisten's instructions for installation: that is correct?

A That's correct.

Q And you also had no direct testimony about the Meister-Leisten product, correct?

A I think that's correct.

(Emphasis added). As seen from the foregoing, complainants' expert testified before this administrative law judge that there are other ways to install floor panels other than the "angle-displace-angle" ("angle-slide angle") and the "angle-slide-snap" methods. Moreover, he agreed that it was a fair statement to say that there are many other ways of installing the accused mechanically locking flooring panels than those taught in the asserted claims of the '267 and '907 patents. In addition, as seen from the foregoing he offered no direct testimony on the Meister-Leisten's instructions for installation.

Based on the foregoing, even assuming direct infringement by any of the accused products had been established which it has not, the administrative law judge finds that complainants have not established that there are no substantial noninfringing uses for the accused products and hence he would find no contributory infringement.

VII. Domestic Industry

The administrative law judge has already determined that complainants satisfied the economic prong of the domestic industry requirement, see Order No. 26 (July 10, 2001).

Complainants, however, must still satisfy the technical prong of the domestic industry. Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366, Comm. Op. at 8 (Dec. 15, 1995), aff'd sub nom, Minnesota Mining & Manufacturing Co. v. U.S. Int'l Trade Comm., 91 F.3d 171 (Fed. Cir. 1996). The test for claim coverage for the purposes of a domestic industry under section 337 is the same as that for infringement. Certain Doxorubicin and Preparations Containing Same, Inv. No. 337-TA-300, Initial Determination at 22 (Oct. 22, 1990).

The administrative law judge has already construed the claims and found that the existence of play is involved in the asserted claims of each of the '267, '907 and '410 patents.

Complainants rely on three products to prove domestic industry for all of the asserted patents. (Wennerth, Tr. at 449). The first is called Alloc Original; the second one is Alloc Home; and the third one is Lock-It, sold under three different brand names. (Wennerth, Tr. at 449). Installation instructions for these products are provided with the products to the consumer at the point of sale. (Wennerth, Tr. at 449). Alloc also distributes other instructional materials for installation of its products. (Wennerth, Tr. at 455-57). Alloc makes available to the end-user of its Alloc Home mechanically-locking flooring system a video of its recommended installation instructions. (Wennerth, Tr. at 455-57). This video, CPX-2, visually demonstrates and audibly instructs how to install the Alloc Home product using at least three methods. (Wennerth, Tr. at 455-57).

CX-18 is a copy of Alloc's installation instructions found in packages of Alloc products. (Wennerth, Tr. at 449-50; CX 18). Pictures 1-5 of CX-18 describe the "angle slide angle

method" of installing Alloc boards, while pictures 9 and 10 of CX-18 describe the "angle slide snap method" of installing Alloc boards. (Wennerth, Tr. at 454; CX-18 at 4). When installing panels under a threshold or under a door, Alloc's installation instructions also allow the panels are to be slid together on both the long and short sides. (Wennerth, Tr. 518; CX-18 at 5, 9 and 10).

CX-40 is a set of installation instructions for the Armstrong Swift-Lock product,[36] taken from the Armstrong website. (Limbert, Tr. at 825). The Alloc instructions direct the installer to place the long edge of a board at an angle against the long edge of a board in the previous row, and then press down and forward at the same time. (CX-17 at Step 6). The Alloc instructions then direct that the installer next place the short side of the new board at an angle to the short side of a previously positioned board and lay the new board into place. (CX-17 at Step 7). The Alloc instructions next direct the installer to lift the board and the adjacent board in the same row approximately 1 and 1/12 inch, and push the long side of the new panel into the prior row. (CX-17 at Step 8).

In the first method shown on CX-18, the Alloc instructions direct the installer to place the long edge of a board at an angle against the long edge of a board in the previous row, and then press down and forward at the same time. (CX-18 at Step 3). The Alloc instructions then direct that the installer next place the short side of the new board at an angle to the short side of a previously positioned board and lay the new board into place. (CX-18 at Step 4). The Alloc

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[36] At closing arguments the parties admitted that the Alloc products are distributed by Armstrong under the name Swift-Lock. (Tr. at 2524-26).

instructions next direct the installer to lift the board and the adjacent board lying in the same row approximately 30 millimeters and press the long side against the above row and then put them down when the boards are tight against each other. (CX-18 at 4).

In an alternative method to the method of installation shown by steps 4 and 5 (and figures 4-5), the Alloc instructions direct that an installer first push the long side of the board at an angle against the previous row and then lay the new board into place. (CX-18 at Step 9). The Alloc instructions then direct an installer to place the tapping block on top of the locking mechanism of the short edge and lightly tnp the short edges together until the locking element snaps into the locking groove. (CX-18 at Step 10). The Alloc instructions state that a board can be easily removed or uninstalled by lifting that board and tripping along the joint. (CX-18 at Step 6).

The Alloc installation video, CPX-2, shows two methods of installing the Alloc mechanically locking floor product. (CPX-2). With the first method of installing the Alloc Home product, the installation video, CPX-2, shows the following steps: (1) the installer completes the first row by pressing down the short ends of the planks together; (2) to connect the planks in the second row, the installer places the board at an angle against the previous row and presses down and forward at the same time; (3) the installer then places the short side of the new board and angles and lays it into place against the short side of the first board in the second row; and (4) the installer then lifts the new board and also the first board approximately 1 and 1/4 inch and pressing the long sides against the first row, putting them down when the boards are tight against each other. (CPX-2). The Alloc installation video also teaches the method of installing the Alloc Home product

by using a hammer and the Alloc tapping block. In order to use this method, the installer (1) connects the longside of the planks first, (2) then places the tapping block against short end, and (3) then gently taps the tapping block with a hammer until the short ends of the planks are connected. (CPX-2).

None of the Alloc installation instructions mention or reference the concept of play existing between the surfaces of the locking groove and the locking element of complainants' products.

A. The '907 Patent

Complainants argued that their products practice all of the asserted claims of the '907 patent. In support of their contention that their products practice claim 1 of the '907 patent they rely on the following testimony by Limbert:

Q Do you have an opinion as to whether or not the Alloc installation instructions are covered by claim 1 of the '907 patent?

A I do.

Q And are they – and please explain the basis.

A The installation instruction for the Alloc glueless laminate flooring product are covered by the limitations in claim 1 of the '907 patent.

The reason for that is the same as for all these others, that they illustrate or talk about both the first and second mutual positions and then they describe the

> procedure of assembling the panels by the three steps of bringing, displacing and angling

(Tr. at 782-83).

However, Limbert has asserted that the complainants' products practice claim 1 of the '907 patent and need not have play as that term is defined in the '907 patent. Thus, he testified:

> JUDGE LUCKERN: Let me ask you just a little question about claim 1 of the '907 patent. And I believe you may have already testified to that point yesterday. But I don't want to take time to review the transcript, Doctor.
>
> But if you look at claim 1 of the '907 patent – do you have that there in front of you?
>
> MR. O'BRIEN: CDX-1, for the record.
>
> THE WITNESS: I have it.
>
> JUDGE LUCKERN: And if you look at the item B,which is at column 10, starts maybe line 64, you see B:
>
> While maintaining said second mutual position between a new panel and the second panel, displacing the new panel relative to the second panel; do you see that language?
>
> THE WITNESS: Yes, I do.

JUDGE LUCKERN: Is it your opinion that someone of ordinary skill of the art, reading this particular clause and looking at the specification, would come to the conclusion that that displacement does not require play?

THE WITNESS: I'm not sure if reading that particular claim, that one would come to that determination.

JUDGE LUCKERN: How about looking at the specification of the patent, somebody of ordinary skill in the art looking at the specification that receives this that precedes this claim?

THE WITNESS: Well, this patent is one of the two method patents.

JUDGE LUCKERN: Correct.

THE WITNESS: And not one dealing with the structure.

JUDGE LUCKERN: But in a method you have to require a particular structure, you're making something by the method, aren't you? I'm not being argumentative.

THE WITNESS: Yes, I think I understand.

JUDGE LUCKERN: There's a structure that you end up with and you use a method, you perform all these steps and you end up with a strucutre, and my point is in performing this step B while maintaining said such second mutual position between the two panels and displacing the new panel relative to the second panel,

that one of ordinary skill in the art looking at this claim, looking at the specification, would come to the conclusion that you don't need play to do that?

THE WITNESS: I believe that is correct. One does not need play to perform that operation. One needs to have a joint in which the amount of force required to displace the panels is not so great as to cause some damage or be undoable by one who is installing the panels.

As we discussed yesterday, there are three places in the specification for these patents where the – where the word "play" is – where the word "play" exists. In two of those, it is preceded by the word "can" so that, to me, and I think to anyone doesn't mean that it must exist. And one of those cans requires some – involves some other work such as pressing the upper edges of the panels together.

So I think that's certainly one indication that play is not required in order to perform this displacing step of B in claim 1 of '907.

I can also point out that with regard to the use of the term "can," that further in a specification there is some description relating – related to an underlayment, that the design can include an underlayment with the panels. And there has been no discussion of requiring underlayment with the panels in the methods of instructions here. So that's dealing with the term "can" associated with "play."

I further note that there – that what we really need to be able to do here is displace the panels. And I would

> point to – let me get the reference for you. I'll refer you to column 4.

(Tr. at 783-85) (Emphasis added).

Based on the foregoing, the admintstrative law judge finds that Limbert's testimony provides no evidence to support a finding that complainants' commercial products involve play. Also complainants do not proffer any other evidence that their products involve play, as they rely solely on Limbert's testimony and the aforementioned instructions. Accordingly, the administrative law judge finds that complainants have not met their burden of proof with respect to claim 1 of the '907 patent.

Similarly, with respect to claims 2 and 3 of the '907, which are dependent on claim 1, complainants rely solely on the instructions and the excerpt of Limbert's testimony cited above. Accordingly, complainants have failed to have provided any evidence that their products have play and therefore the administrative law judge finds that complainants have not met their burden of proof with respect to claims 2 and 3 of the '907 patent.

B. The '267 Patent

Complainants argued that their products practiced claims 19, 23 and 39 of the '267 patent. In support of this contention they again rely solely on the testimony of Limbert and the aforementioned instructions. In particular, Limbert testified:

> It is my opinion that the Armstrong Swift-Lock laminate flooring installation instructions are covered by the limitations in claim 19 of the '267 patent. The

basis for that is similar to that as described previously for the Unilin and Pergo products.

(Tr. at 825).

In Limbert's previous testimony concerning the Unilin and Pergo products and whether they practiced claim 1 of the '267 patent, Limbert mhde no mention of play. (See FF 122). Therefore Limbert's testimony provides no evidence that complainants' products have play, and hence complainants have not met their burden of proof with respect to claim 19 of the '267 patent. Complainants cite to no additional evidence in the record to support their claim that their products practice claims 23 and 39 of the '267 patent, than what they cited to in relation to claim 19. Accordingly, there is no evidence that their products involve play and therefore complainants have not met their burden of proof with respect to claims 23 and 39 of the '267 patent.

C. The '410 Patent

Complainants asserted that their products meet all the required limitations of the asserted claims for the '410 patent. In support of their assertion, complainants rely solely on the following testimony by Limbert:

Q Now with respect to the Armstrong product and claim[s] 1, 26 and 39 of the '410 patent, is the same – do you have an opinion as to whether that product is covered by those claims?

A Yes, I believe that the Armstrong Swift-Lock product is covered by the claim – by claim[s] 1, 20 – by the –

Q 1, 26 and 39?

A By 1, 26 and 39 of the '410 patent, yes.

Q And is your opinion – is the bases for your opinion regarding the Armstrong product any different than the bases for your opinions which you've given just previously with respect to the Unilin product?

A Well, except that it's based upon the Armstrong product as opposed to the Unilin Uniclic product.

Q But you can find the same elements in the Armstrong product that you testified to with respect to the Unilin product; is that correct?

A Yes.

(Tr. at 813) (Emphasis added).

In Limbert's testimony concerning why he believed that the Unilin product infringed claims 1, 26 and 39 of the '410 patent, which is the reason why he testified the Armstrong product practices the asserted claims, the existence of play in the Unilin joint was not one of his bases for asserting that the Unilin product infringed. (See FF 123). Therefore, the sole evidence relied upon by complainants for asserting that their products practice claims 1, 26 and 39 of the '410 provides no basis to support a finding that their product has a joint with play. Furthermore, although complainants argued that their products also practice claims 41 and 48 of the '410, they cite to no further evidence than the portion of Limbert's testimony cited to in connection with claims 1, 26, and 39 of the '410 patent. Accordingly, the administrative law judge finds that

complainants have not met their burden of proof of showing that their products involve play, as required by the asserted claims of the '410 patent.

VIII. Prior Art

Patents are presumed valid. 35 U.S.C. § 282. That presumption remains with the patent owner and can be overcome only by clear and convincing evidence. Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F. 2d 1367, 1375 (Fed. Cir. 1986), cert. denied 480 U.S. 947 (1987).

Respondent Akzenta has cited U.S. Patent No. 4,426,820 to Terbrack et al. (Terbrack), Japanese Patent No. 3,169,967 to Hayashi et al. (Hayashi) and U.S. Patent No. 2,142,305 to Davis (Davis) as the "most important relevant prior art."[37] It argued that Terbrack anticipates each of the asserted claims of the '907 patent; that Hayashi and Davis each anticipates each of the asserted claims of the '410 patent; and that Terbrack in view of Hayashi and Terbrack in view of Davis renders obvious to a person of ordinary skill in the art[38] each of the asserted claims of the '267 patent. (RAPost at 24 47).

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[37] The other respondents have joined in the submissions of Akzenta regarding prior art (RUPost at 82, RPPost at 85, RRPost at 24-25).

[38] A person of ordinary skill in the art would be a person who has, for example, a BS in engineering or wood science or somebody who has at least three to four years of experience working in a mechanical trade or designing joints. (Loferski, Tr. at 1252).

A. The '907 Patent

Terbrack, relied on by Akzenta for anticipating each of asserted claims 1, 2 and 3 of the '907 patent, was one of the references cited by the Examiner. The Examiner allowed the asserted claim over the prior art, which included Terbrack, because the prior art failed to teach a method for laying and mechanically joining parallel rows of rectangular building panels wherein when the panels are interlocked, so that they are mechanically locked in a first direction that is at a right angle to the plane of the panels, and are mechanically locked in a second direction that is at a right angle to the adjacent joint edges and to the first mechanically locked direction, such that when the panels are interlocked they can still be displaced in a direction adjacent the joint edges. (FF 101) (Emphasis added).

Terbrack at col. 1 lines 39-66 under the subheading Summary Of The Invention, in describing the embodiment having conventional tongue and groove connections in one direction, expressly states that the connections in the other direction (i.e., the connections illustrated in Figs. 2-5) prevent displacement. Thus it discloses (RX-31):

> According to the present invention, this object is achieved in that said panel includes, in the Y direction, means to form a groove and tongue joint with an adjacent panel, that a connection or joint preventing displacement is provided between adjacent panels in the direction. The connection comprises a recess or groove formed in the edge of one of the adjacent panels above which a protruding nose or lug is provided which joins said recess through an inclined face such that said recess defines a cavity having the shape of a truncated wedge surface. Between said

> recess and said panel edge there is provided a raised part the upper edge of which extends in parallel with the panel surface and which terminates in an inclined face in front of said recess. The edge configuration of the adjacent panel is such that this panel engages into the edge configuration of the first mentioned panel in such a manner that, for example, the projection engages into said recess of said first mentioned panel. This defines between both panels a joint preventing displacement between both panels. Furthermore, said edge has formed therein the X direction, in front of the end face of said panel, a recess approximately in the region of the neutral zone of said panel. A clip or clamp is adapted to be driven into said recess, which clamp simultaneously engages into a corresponding or complementary engages into a corresponding or complementary recess of the laterally adjoining panels, so as to form a clamping connection between the adjacent or adjoining panels in the X direction.

(Emphasis added). The Terbrack patent specification states (RX-31. col. 2. lns. 9-15) that:

> The technical advance of the invention resides in the fact that problems in the production of the panels, regarding their shape and the connector means, are avoided, and that assembly of the sports ground is extremely easy, while the panels are secured to each other in such a manner that relative displacement cannot occur.

Hence, as seen from the above, Terbrack teaches away from any displacement which involves play as the asserted

claims have been construed.[39] Moreover respondent Akzenta does not contest the validity of the asserted claims as they have been construed by the administrative law judge. (Tr. at 2360). Thus Akzenta agreed that only when the feature of play is removed from the claims of the '907 patent is the asserted claims invalid over Terbrack. (RAPost at 34-35; Tr. at 2360).

B. The '410 Patent

Respondent Akzenta argued that the '410 patent is drawn towards a particular joint construction enabling the joining of floor panels mechanically and releasably and that every feature of the assorted claims of the '410 patent is anticipated by each of Hayashi and Davis (RAPost at 38). The claims in issue have been found to require play. Thus Akzenta does not challenge the validity of the asserted claims. (Tr. at 2360).

C. The '267 Patent

Respondent Akzenta argued that each of the asserted claims of the '267 patent is obvious in view of Terbrack in combination with either Hayashi or Davis and that although both the Terbrack and Hayashi references were before the Examiner during the examination of those patents, such examination was carried out on inventions that required play; and that "removing play from the claims of the '267 patent removes the sole feature that distinguished the invention, and thus renders the asserted claims obvious and invalid." (RAPost at 43). The asserted claims in issue have been found

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[39] Construction of a claim must be the same in determining both validity and infringement. Medtronic, Inc. v. Cardiac Pacemakers, Inc., 721 F.2d 1563, 1583 (Fed. Cir. 1983).

to involve play and Akzenta does not challenge the validity of those claims. (Tr. at 2360).

IX. Patent Misuse

Roysol argued that complainants have misused the patents in issue and hence lost their rights to "defend their patents" (RRPost at 35). However the administrative law judge finds that Roysol has failed to meet its burden in establishing bad faith, or and an expansion of the scope of the protection afforded by the patents in issue and an anticompetitive effect on the market for glueless laminated flooring products.

Patent misuse is an equitable defense to an accusation of patent infringement, the successful assertion of which "requires that the alleged infringer show that the patentee has impermissibly broadened the 'physical or temporal' scope of the patent grant with anticompetitive effect." Windsurfing Int'l, Inc. v. AMF, Inc., 782 F.2d 995, 1001, 228 U.S.P.Q. 562, 566 (Fed. Cir. 1986) (quoting Blonder-Tounge Lab, Inc. v. Univ. of Ill. Found., 402 U.S. 313, 342 (1971)). The concept of patent misuse arose to restrain practices that do not violate existing substantive law, but "dr[a]w anticompetitive strength from the patent right," and are thus contrary to public policy. Mallinckrodt, Inc. v. Medipart, Inc., 976 F.2d 700, 704 (Fed. Cir. 1992). In essence, the doctrine of patent misuse has been confined to situations in which the patentee is attempting to extend the patent grant beyond its limits as provided in the patent statute. However, a party's assertion of its patent rights is accorded a presumption of good faith, and this presumption is only overcome if the party asserting that such activity constitutes patent misuse presents sufficient evidence of bad faith. C.R. Bard, 157 F.3d at 1369.

There are situations in which the activities of a patentee or patent owner have been found to constitute per se patent misuse, such as price-fixing and tying restrictions associated with patented inventions or licensing of patents. See, e.g., Morton Salt Co. v. Suppiger, 314 U.S. 488, 491 (1942) (holding that the tying arrangement where a license under the patent for salt container is conditioned on the purchase of salt from the patentee, which is a separate staple good in commerce, is per se illegal); Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502 (1917) (holding that license notice that was attached to patented movie projectors which stated that purchaser of projector had right to use the machine only with photographic film leased from the patentee is illegal tie-in subject to per se analysis); Straus v. Victor-Talking Mach. Co., 243 U.S. 490 (1917) (stating that attachment of notice to patented phonographic machines requiring a minimum transfer price is per se illegal); Bauer & Cie. v. O'Donnell, 229 U.S. 1 (1913) (holding that sale of patented product with notice stating that product is licensed, but with restriction that it cannot be sold by licensee at less than a dollar is price-fixing restriction subject to per se analysis).

However, if an activity is not patent misuse per se, it must then be determined whether the activity is excluded from misuse analysis under 35 U.S.C. § 271(d) (1994).[40] This

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[40] 35 U.S.C. § 271 (d) reads in part:

> No patent owner otherwise entitled to relief for infringement or contributory infringement of a patent shall be denied relief or deemed guilty of misuse of illegal extension of patent right by reason of his having done one or more of the following...

statutory section provides that there are certain activities of a patentee that do not constitute misuse. Finally, if the activity in question does not fall under § 271(d) and is not patent misuse per se analysis, then a court must determine whether the activity "is reasonably within the patent grant, i.e., that it relates to subject matter within the scope of the patent claims." Virginia Panel Corp. v. MAC Panel Corp., 133 F.3d 860, 869 (Fed. Cir. 1997) (quoting Mallinckrodt, 976 F.2d at 708). If the activity of the patent owner or patentee has the effect of broadening the scope of the patent claims, and does so with an anticompetitive effect, then that activity must be analyzed under the "rule of reason." Virginia Panel, 133 F.3d at 869. Under the rule of reason analysis, "the finder of fact must decide whether the questioned practice imposes an unreasonable restraint on competition, taking into account a variety of factors, including specific information about the relevant business, its condition before and after the restraint was imposed, and the restraint's history, nature, and effect." State Oil Co. v. Kahn, 522 U.S. 3 (1997), cited in Virginia Panel, 133 F.3d at 869.

Roysol argued that complainants misused their patent rights. Misuse occurs when the patentee uses their patents to obtain a benefit more extensive in scope than that granted by the PTO. See Mallinckrodt, 976 F.2d at 704. Roysol has admitted that the alleged activities forming to basis for its misuse defense do not fit within any of the categories of anticompetitive activities that require a per se analysis, (Tr. at 2534), and therefore the activities that Roysol alleges to constitute patent misuse are to be analyzed under the rule of reason.

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(3) sought to enforce his patent rights against infringement or contributory infringement ....

Roysol asserted that Norwegian Wood was shut down as a direct result of complainants' threats, that there were threats made against others in the laminate flooring business that caused them to abandon the laminate flooring business, and argued implicitly that this loss of competition has increased the scope of subject matter protection afforded complainants under their patents. The administrative law judge however finds no indication from the record that complainants' attempts to pursue potential infringers has resulted in an unlawful increase in the scope of protection afforded under complainants' patents.

Under the rule of reason analysis, a good faith belief that complainants' patents are being infringed "violates no protected right when it so notifies infringers." Virginia Panel, 133 F.3d at 869. A patentee must be able to assert its rights against parties that it believes are infringing its patents without being subject to patent misuse claims. Roysol argued that complainants contacted Norwegian Wood and issued threats and warnings for the purpose of forcing it out of the entire laminate flooring regardless of the method of installation used by Norwegian Wood and whether the method was covered under any of the patents owned by complainants. (RFF 12.1, 12.5, 12.6, 12.7). The administrative law judge finds that there is no evidence of bad faith in complainants' actions in relation to Norwegian Wood or sufficient evidence of an attempt to force it out of the entire market or to keep it from entering the market. Rather he finds that the record indicates that complainants placed Roysol and Norwegian Wood on notice as to the existence of complainants' U.S. patents and complainants' belief that Norwegian Wood's distribution activities infringed one or more of those patents. (JX-23 at 255). Likewise, the record does not indicate that complainants "took the position with Norwegian Wood that the limited number of U.S. patents owned by complainants

prevented any other company from selling glueless laminate flooring". The fact that complainants were aware that U.S. customers and potential customers were looking for alternative laminate flooring products (RX-4012; RFF 12.3) is irrelevant for the purpose of this patent misuse inquiry because this fact does not help establish bad faith, expansion of the scope of complainants' patent protection, or anticompetitive effect in the relevant market.

Roysol relied heavily on a letter written by{ } (RX-4012) to support its allegation that complainants attempted to restrain competition in bad faith. The letter stated:

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The administrative law judge finds no language in RX-4012 to support Roysol's assertions

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To the contrary he finds that the letter does not indicate that complainants have done anything which goes beyond normal steps that a party takes to enforce its patent rights. Also, the { } when read in context of the entire record, is found not to evidence bad faith, or anticompetitive activities on the part of complainants, but rather is a request that Norwegian Wood announce that they have switched to Norske Skog Flooring products. (RX-4061). Roysol alleged that Pervan threatened to bring "vastly superior economic force" against Norwegian Wood to make it abandon the entire market. (RFF 12.11, 12.15). However, the administrative law judge finds that the discussion by

Pervan of Norwegian Wood's legal options and the potential costs of those options (RX-4055; RX-4061; JX-23 at 242) and a{

} are permissible activities by complainants who suspected that Norwegian Wood was infringing complainants' U.S. patents. See Virginia Panel, 133 F.3d at 869.

Roysol cited Kobe, Inc. v. Dempsey Pump Co., 198 F.2d 416, 421 (10th Cir.), cert. denied, 344 U.S. 837 (1952) (Kobe) in support of its position that complainants have attempted to expand the scope of protection provided under their patents in bad faith. In Kobe the plaintiff told the defendant that no one could build a pump without infringing at least one of a pool of patents owned by the plaintiff, even though the plaintiff knew that the defendant's pump outperformed its own, cost less, and would be competitive against its own pump. Here, the administrative law judge finds no indication that complainants told Norwegian Wood that it was infringing, knowing that the accused product distributed by Norwegian Wood was a better or noninfringing product.

Roysol, to demonstrate the anticompetitive effect necessary to satisfy the rule of reason analysis, argued that "[t]here is evidence of anti-competitive motivation for the over assertion of the limited rights... Darko Pervan's announced concern was to prevent potential price competition from Roysol." (RPost at 32). A letter sent to Bogaard (Co-CEO of Norwegian Wood) on October 6, 1999 from Otto von Ubisch (of Norske Skog Flooring), however, stated that Otto had advised Norwegian Wood not to enter the field of laminate flooring due to the extensive patent position of complainants. (RX-4044). The letter went on to cite the '621 and '267 patent, which Ubisch believed were infringed by

Norwegian Wood's distribution activities in the United States. (RX-4044).

Additionally, the testimony of Bogaard and the letters sent to Norwegian Wood demonstrate that there is a language conversion problem which cautions against taking "get out of the field" as a literal anticompetitive threat or anything more than an attempt to permissibly assert the patent rights in good faith. (JX-23 at 277, ll.3-24). In addition, Bogaard testified that "he [von Ubisch] basically implied that you should stop all sale of self-locking glueless laminate flooring because all of the systems that existed supposedly infringe the patent." (JX-23 at 255).

Roysol alleged that Norwegian Wood's contract with Roysol was terminated because of the warnings issued by complainants. However, the administrative law judge finds that the testimony of Bogaard indicates that Roysol terminated its relationship with Norwegian Wood because Norwegian Wood did not fulfill the volume requirement under the distributorship agreement. (JX-23 at 41). Furthermore, Norwegian Wood is still in the business of distributing flooring products, just not "mechanically locking" flooring products. (JX-23 at 40). Also, when Bogaard was asked whether Norwegian Wood was "precluded" from distributing mechanical flooring products, Bogaard did not respond that Norwegian Wood had been kept out of that market by some affirmative action on the part of complainants, but that Norwegian Wood no terminated it. (JX-23 at 40-41). Additionally, Bogaard stated that, "We were thrown out of our only customer due to issues we have discussed today. And without a customer... you have to stop." (JX-23 at 285). Further, the administrative law judge finds that Menards (Norwegian Wood's only customer), terminated its distribution contract with Norwegian Wood and Roysol as a

result of threats about patent infringement, not as a result of any anticompetitive behavior by complainants. (JX-23 at 200-04).[41] Accordingly, Roysol has not satisfied its burden of demonstrating the anticompetitive effect of complainants' activities. See Virginia Panel, 133 F.3d at 869 (stating that if the activity of the patent owner or patentee has the effect of broadening the scope of the patent claims, and does so with an anticompetitive effect, then that activity constitutes patent misuse).

Roysol, relying on RX-4010, RX-4021 and RX-4036, asserted that the activities of complainants were based on their desire to restrict price competition in the laminate flooring market. The administrative law judge finds that the cited documents do not support this argument. RX-4021 is an indication by complainants that "judges" may find that Unilin does not infringe complainants' patents. The administrative law judge finds that RX-4010 and RX-4036 merely pertain to complainants' view of activities of competitors as cheapening the overall perception of laminate flooring products.

X. Remedy

Based on the record the administrative law judge has found no violation of section 337 by any of the respondents. Hence he is not recommending any remedy. Assuming the Commission should determine that there is a violation of section 337, the Commission "shall direct that the articles concerned... be excluded from entry into the United States," unless public interest factors specified within the statute are

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[41] Regarding the alleged anticompetitive effect, the administrative law judge notes that in a recent 12 month period the approximate value of Pergo's imports of accused products was { } See XI Bonding infra.

considered to counsel against it. 19 U.S.C. § 1337(d).[42] Under the statute the Commission has the authority to issue an exclusion order, a cease and desist order, or both. 19 U.S.C. § 1337(d) and (f).

Complainants argued that that the Commission should issue a limited exclusion order barring entry of any infringing products, including the instructions of respondents Unilin, BHK, Meister-Leisten, Pergo, Akzenta, and Roysol or any of their affliated companies, parents, subsidiaries, contractors, or other related business entities, or their successor or assigns and further should issue a cease and desist order prohibiting respondents' continued and contemplated activities in the United Stales relating to their infringing products. (CPost at 110).

Complainants also argued that any exclusion order must cover Unilin's alleged infringing Uniclic products, including infringing instructions, and not be specifically limited to the products as they have been named in this investigation; and that as Unilin licenses its infringing products to BHK, Meister-Leisten, and Pergo, an exclusion order applicable to Unilin would necessarily cover each of those other alleged infringing respondent licensees of the Uniclic technology. (CPost at 111-112).

Complainants, referring specifically to respondent Akzenta, argued that the exclusion order should cover all infringing products of Akzenta and Classen, which is related to Akzenta. Moreover, it was argued that the products should

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[42] The issue of public interest concerns is reserved for the Commission. See Commission rules 210.42 and 210.50.

not be limited to the products as they have been named in the investigation. (CPost at 112-114).

Complainants, referring specifically to Roysol, argued that it is the intent of Roysol to resume importation and/or sales of the accused Snap Floor product or another product under a different name in the United States in the months following tlm section 337 administrative hearing and that the exclusion order should encompass all Roysol products incorporating the patented technology at issue. (CPost at 114).

Complainants, in addition, argued that any effective remedy must include a cease and desist order prohibiting respondents or any of their affiliates from importing, renaming, selling, advertising, distributing, marketing, transferring, or offering for sale respondents' accused products inside the United States or outside the United States for sale in the United States. (CPost at 115-116).

Respondent Unilin argued that if the Commission determines that Unilin does violate section 337, complainants would not be entitled to relief because of their continuing infringement of Unilin's patents.[43] Moreover it was argued that should the Commission determine to issue a cease and desist order to the Unilin respondents, the terms of any such order should clearly differentiate between domestic and foreign made Unilin products. (RUPost at 82-83, 85).

Akzenta argued that the limited exclusion order and cease and desist order proposed by complainants is overly broad. (ARe at 61). Roysol argued that no cease and desist order is

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[43] Any alleged infringement of a Unilin patent, such as U.S. Patent No. 6,006,486, was not in issue in this investigation.

warranted against Roysol as complainants failed to establish that Roysol maintains a commercially significant inventory in the United States and that any limited exclusion order should be an order which instructs the U S. Customs Service to exclude from entry all articles which infringe the involved property right and that originate from a company that was a party to the Commission investigation. (RRe at 36-37). Pergo argued that complainants have overstated the relief warranted. (PRe at 60-61).

The staff argued that if a violation of section 337 is found, the appropriate remedy is a limited exclusion order prohibiting the entry of each of respondents' flooring panels that infringe the claims of the patents upon which the finding of violation is based. It argued that cease and desist orders are warranted primarily when a respondent maintains a commercially significant inventory of the accused products in the United States and that the evidence indicates that at least some of the domestic respondents (Unilin and BHK) maintain a significant inventory of accused flooring panels in the UnitedStates. Accordingly, if a violation by any of those domestic respondents is found, a cease and desist order would be appropriate as to those respondents.

The administrative law judge has found that there has been importation by each of the respondents of the accused flooring panels. However, he has found no violation of section 337 by said respondents and hence he is not recommending any remedy. Should the Commission find a violation, it is recommended that at most a limited exclusion order issue which prohibits entry of flooring panels of each of the respondents and their affiliates which the Commission determines to infringe any of the claims in issue of the asserted patents.

As to any cease and desist order, as of November 30, 2000, BHK of America had in inventory{ } worth of Uniclic product (CX-1332). Classen US, which is affiliated with Akzenta (FF 65, 66, 67), maintains an inventory in the United States of its mechanically locking flooring products. (CX-852; CX-886). Hence, should the Commission determine there is a violation of section 337 by BHK of America and Akzenta, the administrative law judge recommends a cease and desist order issue against BHK of America and Classen US.

XI. Bonding

Section 337 provides that the bond during the Presidential review period should be set at an amount "sufficient to protect the complainant from any injury" 19 U.S.C. 1337(j)(3). Based on the record the administrative law judge has found no violation of section 337 by any of the respondents. Hence he is not recommending any bond. Assuming the Commission determines that a violation of section 337 has occurred complainants argued that the Commission routinely sets bonds at 100 percent and has set them as high as 460 percent of entered value and that a bond at 100 percent of the entered value of the alleged infringing flooring panels should be set. (CPost at 116).

Respondent Unilin argued that the Commission has determined that a reasonable royalty rate is an appropriate measure to estimate the amount of bond necessary to offset any competitive advantage resulting from the unfair method of competition or unfair acts enjoyed by persons benefitting from the importation. Accordingly it argued that the bond should not exceed { } of imported product, which is the{ } (RUPost at 86). Akzenta argued that an appropriate bond, if necessary, is the{

} (ARe at 62). Roysol argued that it currently has no distributor and therefore the likelihood of injury to the complainants from sales of Snap Floor in the United States is negligible. Hence, Roysol argued that the Commission should set no bond for Roysol. (RRe at 37).

The staff argued that given the number of respondents, the wide range of products involved in this investigation and their disparate prices, the most appropriate bond is 100 percent of entered value. (SPost at 39).

Respondents are in the U.S. market. Thus the quantity of Pergo's imports of the accused Presto product was approximately{ } in the 12-month period ending December 31, 2000. The approximate value of those imports, in terms of their cost to Pergo, was{ } in the same period. (Pergo Resp. to Complaint, Additional Information Required by Rule 210.13(B), at ¶ 1, p. 16). Also, Pergo's records available as of approximately February 2001 indicate that Pergo had sold{ } worth of Presto product in the United States. (CX-2015 at 25). Moreover royalty rates have{

} In view of the large amount of accused products being imported into the United States and the fluctuation in royalty rates, should the Commission determine that there is a violation of section 337, the administrative law judge recommends a bonding of 100 percent of the entered value.

XII. Additional Findings

A. The Parties

1. Complainant Berry Finance N.V. (Berry) is a Belgian corporation with its principal place of business in Oostrozebeke, Belgium. (CX-200 at p. 3).

2. Berry is a holding company with many different subsidiaries in Belgium and France that make up the Berry Group, which includes complainant Alloc, Inc. (Alloc). (JX-51C, De Smet, Tr. at 7-14). Alloc is a Delaware corporation with its principle place of business in Racine, Wisconsin. (Wemerth, Tr. at 446-447).

3. Hans De Smet is the managing director of the Berry Group. (JX-51, De Smet, Tr. at 7).

4. Complainant Välinge Aluminum AF (Välinge) is a Swedish Corporation, headquartered at Kyrograndenl, S-26040, Viken, Sweden. (CX-300 at 3).

5. The Berry Group has an exclusive license for the Välinge patents. (JX-51, De Smet, Tr. at 30; RX-266; RX-1463).

6. RX-1463, the license agreement between Berry and Välinge, grants a license to Berry to make, use, and sell the products solely in association with the manufacture, sale use, promotion or distribution of laminate or wood flooring. (RX-1463 at 1-3; RX-266 at 1-3).

7. Tony Pervan of Stockholm Sweden is a part owner and actually owns 25 percent of Välinge. (Pervan, Tr. at 222, 223, 279).

8. Välinge was formed to finance the Flooring 2000 project. (Pervan, Tr. at 255).

9. As an employee of Välinge, Tony Pervan's duties include providing engineering expertise and technical support to the company's licensees. (Pervan, Tr. at 223,271-272).

10. Tony Pervan assigned the rights of Swedish patent application SE 9301595 to Välinge on December 26, 1993. (T. Pervan, Tr. at 254-255; CX-11).

11. Respondent Unilin Décor N.V. (Unilin) is a Belgium corporation with its principal place of business at Ooigenstraat 3, B-8710, Wielsbeke, Belgium. (Unilin Response to Complaint at 3, ¶ 3.1).

12. Unilin is in the business of designing, manufacturing and selling flooring products including laminate flooring. (Unilin Response to Complaint at 3, ¶ 3.1).

13. Unilin manufactures its finished flooring products in Belgium in one large plant and one small plant. (Thiers, Tr. at 1433).

14. Unilin manufactures its Uniclic product in Wielsbeke, Belgium. (JX-14, Huyghe, Tr. at 35; Thiers, Tr. at 1432).

15. Unilin does not deny that Quick-Step Uniclic and Moderna product have been imported into the United States or sold in the United States. (CX-1558 at 6-7, and 9; Kamp, Tr. at 1780).

16. Frans De Cock and Bernard Thiers are co-managing directors of Unilin. (Thiers, Tr. at 1480).

17. In 1996, Bernard Thiers was in charge of product development. (Thiers, Tr. at p. 1480).

18. Piet Huyghe is the Export Director for North America at Unilin. (JX-14, Huyghe, Tr. at 6).

19. The purpose of Quick-Step Flooring is to sell Quick-Step Uniclic product manufactured by Unilin in the United States. (JX-15; De Cock, Tr. at 53, Thiers, Tr. at 1432).

20. Unilin has signed a letter of intent to acquire a small company in the United States. (Thiers, Tr. at 1433-1434; CX-1583 at U13013-14).

21. Unilin intends to manufacture product incorporating its Uniclic joint at the newly acquired manufacturing facility in the United States. (Thiers, Tr. at 1434).

22. Unilin expects to begin manufacturing Quick-Step Uniclic product in the United States as soon as the newly acquired plant is tooled to make the Uniclic profile, which will be shortly after the acquisition is complete. (Thiers, Tr. at 1434).

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25. Respondent BHK of America (BHK) is a New Jersey corporation with its principal place of business in 11 Bond Street, Central Valley, New York. BHK also has offices in South Boston. (Kamp, Tr. at 1779; JX-9, Kamp, Tr. at 10; CX-1400 at 5-6).

26. BHK is a subsidiary of BHK Germany. (Kamp, Tr. at 1782). {

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27. BHK's manufacturing plant for furniture components is located in South Boston. (JX-9, Kamp, Tr. at 15).

28. Reiner Kamp is employed by BHK of America as its president. {

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29. BHK admits that it imports Quick-Step Uniclic products into the United States. (CX-1400 at 15).

30. Respondent Meister-Leisten is in the business of manufacturing and selling laminate, veneer and cork floors. (JX-8, Schindler, Tr. at 24).

31. Meister-Leisten is organized as a GmbH. There are three positions within the first level of hierarchy: head of sales and marketing, head of operation and head of administration. (JX-8 at 20).

32. Meister-Leisten's main office is located in Ruthen/Mieste, Germany. (JX-8 at 23-24).

33. Meister-Leisten's manufacturing facility is located in Ruthen/Mieste, Germany. (JX-8 at 24).

34. Ludger Schindler is presently the head of sales and marketing at Meister-Leiston. As head of sales and marketing, Schindler is responsible for the organization of the company's distribution force and has personal responsibility for the entire distribution force including field force and marketing control. (J-X-8 at 5-6).

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38. The current license agreement between Meister-Leisten and Unilin, like the agreement which preceded it, contemplates and acknowledges Meister-Leisten's ability to change or improve the design, manufacture or use of the product. (CX-1576 at 10-11; CX-1129 at 10-11).

39. Perstorp AB is headquartered in Perstorp, Sweden. Pergo AB is headquartered in Trelleborg, Sweden. (JX-20 at 17).

40. Respondent Pergo, Inc. (Pergo) is a wholly-owned subsidiary of Pergo AB. (JX-20 at 5, 6).

41. Pergo is located in Raleigh North Carolina and maintains a manufacturing facility in Garner, North Carolina. It is in the business of marketing and manufacturing, selling, laminate flooring products and accessories. (Von Kantzow, Tr. at 1159).

42. Pergo owns the laminate production facility in Garner, North Carolina. (JX-20 at 20).

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44. Lars Johann Gustaf Von Kantzow is the President and CEO of Pergo, Inc. (Von Kantzow, Tr. at 1158).

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46. Annette Lidman has been employed by Pergo AB{ }

47. Lidman is currently employed by Pergo AB as its "Chief Financial Officer." (JX-20 at 12).

48. Oliver Stanchfield has been employed by Pergo since December, 1994. Stanchfield was initially employed at Pergo as a "technical advisor." As a technical advisor, Stanchfield's duties were to train sales people and installers on the product, knowledge and installation skills of Pergo flooring. (JX-21 at 5, 15, 17).

49. Stanchfield is the Pergo employee most knowledgeable about the instructions for installing Pergo's Presto product. (CX-2015).

50. Todd Mackenzie has been the Manager of Installation Services at Pergo since May, 2000. (JX-19 at 5). Mackenzie's job duties include managing { } Pergo installation training schools in North America. Pergo teaches the proper installation methods for Pergo Presto to professional installers at the Pergo training schools.

Mackenzie also teaches the recommended installation procedure for Pergo Presto at the Pergo installation training schools. (JX- 19 at 8-9).

51. Giana Noonan is employed by Pergo as the Manager of Interactive Marketing. As Manager of Interactive Marketing, she is involved in anything that relates to business with consumers, but her primary function is the website. (JX-16 at 8, 11).

52. Ms. Hunneman helps in the design of point of sale materials for Pergo. (JX-17 at 8-10).

53. Point of sale information is the written information the consumer sees. (JX-17 at 10).

54. Respondent Akzenta Paneel + Profile GmbH (Akzenta) is a German corporation with its principal place of business in Kaiersech, Germany. (Akzenta Response To Complaint ¶ 3.5).

55. Classen is the parent company of Akzenta and Akzenta produces and distributes products on behalf of Classen. (JX-2 at 14).

56. Akzenta produces, packages and ships glueless mechanically locking laminate flooring products that are destined for the United States. (JX-2 at 16).

57. Akzenta U.S.A. LLC is now called Classen USA LLC. (JX-2 at 89).

58. Eisermann is a Managing Director for development, research and production at Akzenta. (JX-3 at 6, 7).

59. Eisermann is familiar with the specifications and manufacturing tolerances for Akzenta's milling machinery. (JX-3 at 21-22).

60. Elbracht is managing director, sales and marketing for Akzenta Wiparquet. (JX-2 at 9).

61. David Colmer is technical manager of Classen USA, LLC. (JX-1 at 10; JX-2 at 89).

62. Akzenta is located at Werner-von-Siemens-Straßle 18-20, 56759 Kaiserseach, Germany. (CX- 1000 at 5).

63. Akzenta is also known under the names "Classen" and "Wiparquet." (CX-1000 at 5).

64. The Akzenta Quick Lock products are no longer imported for sale or distribution in the United States. (RX-3024; JX-6 at 27-28, 43, 80-81).

65. Akzenta's distribution in the United States is administered by Classen USA. (RX-3033).

66. Classen is a supplier of flooring in Germany. (CX-948 at 25).

67. Akzenta and Classen International are subsidiaries of Classen. (CX-948 at 25).

68. Respondent Roysol is a French Societe Anonyme formed May 1, 1997, but in existence since 1995. (JX-24 at 12). Valerie Roy is the Chairman and Chief Executive Officer of Roysol, and has held that position since the founding of Roysol in 1997. (JX-24 at 14). Valerie Roy

reports directly to the Chief Executive Officer of the Roy Group, her father, Alain Roy. (JX-24 at 14-15).

69. Roysol is located at 86, Rue du Faubourg St-Martin, 89600, Saint-Florentin, France. Roysol was incorporated May 5, 1997 in Saint-Florentin France. (CX-447, Response to Commission Staff Interrogatory No. 1(b)-(c), at 2, (NW 00362)).

70. Roy Floor was formed in 1999. Valerie Roy is the sole officer of Roy Floor. (JX-24 at 13).

71. Valerie Roy appeared for deposition as the corporate representative of Roysol and in her individual capacity. (JX-24 at 7, 9).

72. During the period in which the accused Roysol product was imported into the United States, Borge Bogaard was the Co-Chief Executive Officer of Norwegian Wood, of Portsmouth, New Hampshire. (JX-23 at 21, 22, 219).

73. Norwegian Wood was the exclusive distributor of the accused Roysol SnapFloor product in the United States. Norwegian Wood distributed the accused Roysol SnapFloor product pursuant to an exclusive distributorship contract with Roysol from January 1999 until the exclusive distributorship contract was terminated by Roysol in February 2001. (JX-23 at 30, 32; CX-402).

74. Roysol began production of the accused SnapFloor product in 1999. (CX-447, Response to Commission Staff Interrogatory No. 6(c), at 6, (NW 00366)).

75. The U.S. Harmonized Tariff Schedule number under which the accused SnapFloor product is imported into

the United States is 4418-30-99, (CX-447, Response to Commission Staff Interrogatory No. 7(c), at 7, (NW 00367)). The Roysol Snap-Floor product was manufactured by Roysol in France and imported into the United States by Norwegian Wood. (CX.447).

B. The Swedish Application SE9301595

76. The patents in issue all claim priority to an original Swedish application, SE 9301595, filed on May 10, 1993 in Sweden. (RX-1, RX-2, RX-3, RX-1359). It shows the only drawing of a non-play joint. (RX-1359, FIG. 4, Pervan, Tr. at 353).

77. The original Swedish application, SE 9301595, does not discuss play at all. (RX-1359, T. Pervan, Tr. at 303-304, Loferski, Tr. at 1332).

C. The PCT Application

78. On April 29, 1994 Tony Pervan filed PCT application No. PCT/SE94/00386 (RX-348), now abandoned, which claimed priority to original Swedish application SE 9301595. The specification to the PCT application is common to all three of the patents in issue. (JX-54, D. Pervan, Tr. at 88, RX-348, RX-1, RX-2, RX-3).

79. There are differences between original Swedish application SE 9301595 and PCT application No. PCT/SE94/00386. For example, the PCT application does not mention the double-sided tape inventions described and claimed in the original Swedish application (RX-348, T. Pervan, Tr. at 351, Loferski. Tr. at 1332-1334). Also the no play drawing found in Swedish Application SE 9301595 was

excluded from the PCT application. (RX-348, Pervan, Tr. at 353, 354, 361).

80. In an "International Preliminary Examining Report" dated March 27, 1995, with respect to the claims 1-19 that were submitted in the PCT application it was stated (RX-361):

> The present invention related to a system for providing a joint along adjacent joint edges of two building panels, especially floor panels.
>
> The object of the invention is to provide a system for joining together panels for hard, floating floors, which allows using panels of a smaller overall thickness than present-day floor panels and where glue is not required.
>
> According to the invention a first mechanical connection locks the joint edges (3, 4) of two panels to each other in a first direction (D1) at right angles to the principal plane of the panels. A strip (6) is integrated with one joint edge (3) and has an upwardly protruding locking element (8) engaging a locking groove (14) in the rear side of the other joint edge (4) to form a second mechanical connection locking the panels in a second direction (D2) parallel to the principal plane of the panels.
>
> WO 9313280 describes a device for joining floor boards comprising a plate shaped body (1) with legs (2, 3) adapted to engage a longitudinal groove (14, 15) in each of the adjoining floor boards. WO 9313280 was published prior to the international filing date but later than the priority date claimed.

US, A, 3 538 665 describes a joint between floor panels where a strip is inserted in recesses (7) cut along the sides of the panels. The strip is fixed to the panels by adhesive.

FR, 1 293 043 describes a connection between floor boards.

DE, 2 616 077 describes a connecting web for parquet floor panels.

However, none of the cited documents describe a system where a play exists between the locking groove (14) and the locking element (8), where the connection allows mutual displacement of the panels in the direction of the joint edges and where the connection is so conceived as to allow the locking element to leave the groove (14) if the groove panel (2) is turned about its joint edge angularly away from the strip.

The device claimed is therefore novel. It can also be considered to involve an inventive step and to have industrial applicability.

81. In a submission dated June 26, 1997 to the European Patent Office, the applicant's representative stated (RX-1351):

It is hereby confirmed that the claim feature relating to the mutual displacement of the panels in the direction of the joint edges is an intended limitation. This is an essential feature of the invention representing an important functional difference between prior-art panel connections using glue or spring clips. Contrary to the present invention, these two conventional connection

types do not allow for any mutual displacement of the panels in the direction of the joint edges.

The mutual displacement of the panels in the direction of the joint edges is essential, because it makes it possible to mechanically connect not only e.g. the only edges of the panels, but also the short edges. Thus, as described in the application, when a new panel is to be connected, this is essentially performed in a two-step operation. The first step consists of connecting the new panel at its long edge to the long edge of an adjacent panel already assembled on the floor in a neighbouring row. As illustrated in the drawings, this first step can be performed by first positioning the new panel adjacent to the panel on the floor, while holding the new pane inclined upwards. Then, the new panel is turned downwards into contact with the floor. The first step of the two-step operation is then completed. The second step of the operation consists of mechanically connecting one end edge of the new panel with an adjacent end edge of a previously laid panel in the same row. This is done by displacing the new panel along its long edge, in relation to the adjacent panel in the neighbouring row. Thereby, the two end edges can be brought together and be mechanically connected to each other as disclosed in the application. Accordingly, the mutual displacement of the panels in the direction of the joint edge is an essential feature of the invention and makes it possible to perform the above second step of the assembly operation.

However the limitation in the preceding paragraph of claim 1 - that the panels, when joined together, can occupy a relative position in said second direction

where a play exists between the locking groove and the locking surface of the locking element - was introduced into claim 11 mainly in order to distinguish the invention from prior-art spring clips, where the spring clips are biased towards the panel material in groove provided in the lower side of the panels. The prosecution of the present application clearly indicating that the combination of the remaining features in claim 1 is both novel and inventive over the prior art, it is hereby requested, as a primary request, that the application be granted based on the enclosed new claims 1-20 with the heading "New claims - primary request". Claim 1 according to the primary request does not comprise the above limitation regarding the play. It is submitted that this amendment does not contravene Article 123(2) EPC.

As a secondary request, in case the claims according to the primary request cannot be granted, the claims should be amended in accordance with the enclosed amended claims 1-20 with the heading New claims - secondary request".

In the new claims, according to the primary as well as the secondary request, a new claim 14 has been introduced dependent from any one of claims 1-4. According to new claim 14, the strip is integrally formed with the strip panel, i.e. made in one piece with the strip panel. This embodiment according to new claim 14 is disclosed in fig. 5 and is an alternative to the embodiment according to claim 5, wherein the strip is made of a material different from that of the strip panel and fixedly mounted on the strip panel at the factory. The support for new claim 14 can be found in the application on page 12, lines 23 and 24

("alternatively, the strip 6 may be integrally formed with the strip panel 1") and on page 17, line 34 to page 18, line 2 ("in the embodiment of fig. 5, the strip 6 and its locking element 8 are integrally formed with the strip panel 1, the projecting part of the strip 6 thus forming an extension of the lower part of the joint edge 3"). The cross-section of the embodiment disclosed in fig. 5 clearly indicates that the strip 6 is made in one piece with the panel 1.

Moreover, new claims 10 and 11 according to the primary and secondary requests have been corrected such that these claims now correctly are dependent from claim 9 instead of claim 6. Claims 10 and 11 are directed to limitations on a mechanical connection defined in claim 9.

D. Prosecution Of The '621 Patent

82. On May 17, 1995, Tony Pervan, through his counsel, filed in the U.S. Patent Office application 436,224 ('224 application) based on the PCT application and which is the parent application to each of the applications of the patents in issue. (CX-1).

83. The file history of the '224 application which resulted in the '621 patent (parent to the '267, '907 and '410 patents in issue) is contained in CX-123.

84. Original claims 1-19 of Set. No. 436,224 read (CX-123):

1. A system for providing a joint along adjacent joint edges (3, 4) of two building panels (1, 2), especially floor panels, in which joint:

the adjacent joint edges (3, 4) together form a first mechanical connection locking the joint edges (3, 4) to each other in a first direction (D1) at right angles to the principal plane of the panels (1, 2), and

a locking device (6, 8, 14) arranged on the rear side (18, 16) of the panels (1, 2) forms a second mechanical connection locking the panels (1, 2) to each other in a second direction (D2) parallel to the principal plane and at right angles to the joint edges (3, 4), said locking device (6, 8, 14) comprising a locking groove (14) which extends parallel to and spaced from the joint edge (4) of one (2) of said panels, termed groove panel, and which is open at the rear side (16) of the groove panel (2), characterised in

that the locking device (6, 8, 14) further comprises a strip (6) integrated with the other (1) of said panels, termed strip panel, said strip (6) extending throughout substantially the entire length of the joint edge (3) of the strip panel (1) and being provided with a locking element (8) projecting from the strip, such that when the panels are joined together, the strip (6) projects on the rear side of the groove panel (2) with its locking element (8) received in the locking groove (14) of the groove panel (2),

that the panels, when joined together, can occupy a relative position in said second direction (D2) where a play (Δ) exists between the locking groove (14) and a locking surface (10) on the locking element (8) that is facing the joint edges and is operative in said second mechanical connection.

that the first and the second mechanical connection both allow mutual displacement of the panels (1, 2) in the direction of the joint edges (3, 4), and

that the second mechanical connection is so conceived as to allow the locking element (8) to leave the locking groove (14) if the groove panel (2) is turned about its joint edge (4) angularly away from the strip (6).

2. A system as claimed in claim 1, characterised in that when the groove panel (2) is pressed against the strip panel (1) in said second direction (D2) and is turned angularly away from the strip (6), the maximum distance between the axis of rotation of the groove panel (2) and the locking surface of the locking groove (14) closest to the joint edges in such that the locking element (8) can leave the locking groove (14) without contacting the locking surface of the locking groove (14).

3. A system as claimed in claimed 1 or 2, characterised in that the locking surface (10) of the locking element (8) is extended from the front side (22) of the strip (6) through a height in said first direction that is less than or equal to 2 mm.

4. A system as claimed in any one of the preceding claims, characterised in that the first mechanical connection is provided by the joint edge (4) of the groove panel (2) engaging, in said first direction, between the joint edge (3) of the strip panel (1) and the front side of the strip (6).

5. A system as claimed in any one of the preceding claims, characterised in that the strip (6) integrated with the strip panel (1) is made of a material different from that of the strip panel (1) and fixedly mounted on the strip panel (1) at the factory.

6. A system as claimed in claim 5, characterised in that the strip (6), at least for one of the two panels (1, 2), is received in a counter sunk groove (40, 42) in the rear side (18, 16) of this one panel (1, 2).

7. A system as claimed in claim 5 or 6, characterised in

that the strip (6) is mounted in an equalising groove (40) which is countersunk in the rear side (18) of the strip panel (1) and exhibits an exact, predetermined distance (E) from its bottom to the front side (21) of the strip panel (1),

that the part of the strip (6) projecting behind the groove panel (2) engages a corresponding equalising groove (42) which is countersunk in the rear side (16) of the groove panel (2) and which exhibits the same exact, predetermined distance (E) from its bottom to the front side (26) of the groove panel (2), and

that the strip (6) has at least such a thickness that the rear side (44) of the strip is flush with the rear sides (18, 16) of the panels.

8. A system as claimed in claim 7, characterised in that the strip (6) has such a thickness that it is only partly received in the equalising grooves (40, 42).

9. A system as claimed in any one of claims 5-8, characterised in that the strip (6) is fixed to the strip panel (1) by means of a mechanical connection.

10. A system as claimed in claim 6, characterised in that the mechanical connection between the strip (6) and the strip panel (1) comprises a gripping edge (52) defined by two recesses (24, 50) in the rear side (18) of the strip panel, and tongues, lips or the like (54, 56) which are bent or punched from the strip (6) and which press against opposite outer sides of the gripping edge (52).

11. A system as claimed in claim 6, characterised in that the mechanical connection between the strip (6) and the strip panel (1) comprises a recess (58) in the rear side (18) of the strip panel, and tongues, lips or the like (60) which are bent or punched from the strip (6) and which press against opposing inner sides of the recess (58).

12. A system as claimed in any one of claims 5-11, characterised in that the strip (6) is fixed to the strip panel (1) by means of a binder.

13. A system as claimed in any one of claims 5-12, characterised in that the strip (6) is made of a flexible, preferably resilient material, such as sheet aluminum.

14. A system as claimed in any one of the preceding claims, characterised in that the locking element (8) consists of a locking edge extending continuously along the strip (6).

15. A system as claimed in any one of claims 1-13, characterised in that the locking element (8) consists of a plurality of spaced-apart locking elements distributed throughout the length of the strip (6).

16. A system as claimed in any one of the preceding claims, characterised in that the panels (1, 2) are rectangular and intended, at each of their four edges 2, 4, 3', 4'), to be joined to a similar panel by a first mechanical connection of the aforementioned type and a second mechanical connection of the aforementioned type, each panel having a first pair of opposite joint edges (3, 4), one of which is provided with a strip (6) of the aforementioned type and the other of which is provided with a locking groove (14) of the aforementioned type, and a second pair of opposite joint edges (3', 4'), one of which is provided with, a strip (6') of the aforementioned type and the other of which is provided with a locking groove (14') of the aforementioned type.

17. A system as claimed in any one of the proceeding claims, characterised in that an underlay (46) of floor boards, foam, felt or the like is fixed to the rear sides (18, 16) of the panels.

18. A system as claimed in claim 17, characterised in that the underlay (46) is fixed so as to cover the strip (6) in said second direction at least up to the locking element (8), such that a joint between the underlays (46) of the two adjacent panels is offset in said second direction relative to the joint edges (3, 4).

19. A system as claimed in any one of the preceding claims, characterised in that a sealing means, such as a sealing compound, a rubber strip or the like, is provided on the front side (22) of the strip between the locking element (8) and the joint edge (3) of the strip panel to seal against the groove panel (2).

85. The Examiner, in the Office action dated June 14, 1996 acknowledged applicant's election without traverse of species (b) as shown in Figures 2a-c, 3a-c, 4a-b, 6 and 7 in Paper No. 5. It was also stated:

> Claim 12 is withdrawn from further consideration by the examiner, 37 C.F.R. § 1.142(b) as being drawn to a nonelected species of systems for joining building boards, as shown in Figures 1a-b. Election was made without traverse in Paper No. 5.

86. The Examiner in the Office action dated June 14, 1996 acknowledged receipt of priority papers submitted under 35 U.S.C. § 119. (CX-123).

87. Under the subheading "claim rejections- 35 U.S.C. § 102", the Examiner in the June 14, 1996 Office action stated (CX-123):

> 8. Claims 1, 4, 6, and 14-18 are rejected under 35 U.S.C. § 102(b) as being anticipated by TROTTER, Jr. [U.S. Patent No. 4,819,932] TROTTER, Jr. teaches the use of a resilient floor system consisting of floor panels (21, 23, 25) joined by tongue (47) and groove (49) connection and interconnected by spring clip (33). The clip (33) of TROTTER, Jr. engages grooves (37, 43) located on the underside of floor panels (21, 23, 25) located on the underside of floor

panels (21, 23, 25). Clip (33) of TROTTER, Jr. further comprises cleats (39) spaced longitudinally along the locking leg (35). TROTTER, Jr. further teaches the use of an underlay (11) on which the resilient flooring system is to be placed.

88. Under the subheading "claims rejections- 35 U.S.C. § 103," the Examiner in the June 14, 1996 Office action stated (CX-123):

> 11. Claims 3, 5, 7-9, and 13 are rejected under 35 U.S.C. § 103 as being unpatentable over TROTTER, Jr. TROTTER, Jr. discloses the basic claimed device except for a positive recitation of the height and thickness of the clip member. It would have been an obvious matter of design choice to designate the height of the locking element to be less than or equal to 2 mm. Although TROTTER, Jr. doesn't specifically disclose this, it is clear that his clip height falls within what is required by the applicant's claimed device. In reference to claim 5, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight. In reference to claim 7, a large portion of the spring clip (33) of TROTTER, Jr. is flush wilh the floor panels prior to weight being applied. After weight is applied the spring clip member is totally flush with the floor panels.

89. The Examiner, in the June 14, 1996 Action, under the subheading "allowable subject matter" stated (CX-123):

> 12. Claims 2, 10, 11, 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form

including all of the limitations of the base claim and any intervening claims.

13. The following is an Examiner's statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the use of a resilient floor system wherein the locking element is able to exit the locking groove without having contact with the side surfaces of the locking groove, and wherein the system is further characterized by having a tongue and groove arrangement on its underside for interlocking with the locking member.

90. The Examiner, in the Office action of June 14, 1996, under the subheading "conclusion" listed the following prior art made of record and not relied upon but considered pertinent to "applicant's disclosure" Hall U.S. Patent No. 1,988,201 and Bogatoj U.S. Patent No. 5,029,425. (CX-123).

91. Applicant, in a response, received in the Patent Office on October 15, 1996, to the Office election dated June 14, 1996, amended original claims 1 to 20, and stated the following (CX- 123):

Prior Art Rejection:

Claims 1, 4, 6, and 14-18 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,819,931, issued to Trotter, Jr. (hereinafter "Trotter").

There are several important distinctions between the floor system disclosed by Trotter and the system of the present invention. In particular, Trotter is intended to provide a springlike floor surface. In addition, it is

not an intention that Trotter be removable. In contrast to Trotter, it is not an intention of the present invention to provide a springlike floor surface. In further contrast to Trotter, it is an important object of the present invention to provide a removable flooring system. With these distinctions in mind, several distinctions between the claims of the present application and Trotter will now be discussed.

First, the system of claim 1 defines a strip that is integrated with one of the panels. Trotter does not teach or suggest such a strip that is integrated with a panel.

Furthermore, claim 1 further defines the strip as "extending throughout substantially an entire length of the joint edge of the strip panel." Not only does Trotter not teach or suggest a strip integrated with another panel, it clearly does not teach or suggest such a strip as extending throughout substantially an entire length of the joint edge.

Trotter also does not teach or suggest a system wherein two panels, when joined together, occupy a relative position where a play exists between a locking groove and a locking surface on a locking element that is facing the joint edges. Specifically, Trotter uses spring clips to hold the boards together so as to prevent play from occurring between the two boards. The claimed "play" of the present invention is important for two reasons. One, it enables the panels to slide movably with respect to each other along the direction of the joint edge, which is specifically claimed in the penultimate paragraph of claim 1. This movability allows the short ends of the panels to be

placed adjacent each other when installing the floor. Second, the play further enables disassembly of the floor when required.

In contrast to the claimed "play" of the present invention, Trotter specifically states that an intention of his invention is to use the spring clips to hold the boards close together in order to prevent pinching. Thus, Trotter specifically prevents the claimed play. Furthermore, the spring clips of Trotter also further prevent the claimed mutual displacement of the panels in the direction of the joint edges.

To further distinguish Trotter from the claimed "mutual displacement" feature of the present invention, the Examiner's attention is directed to column 4, lines 10-15, wherein the cleats 39 are described. As set forth in the specification of Trotter, the cleats 39 are intended to lock the spring clips 33 into the groove of the board in which the clip is attached. Thus, the cleats 39 clearly prevent any mutual displacement. Even without the cleats 39, the springlike force of the clips 33 and the edges thereof would clearly prevent any mutual displacement of the panels in a direction of the joint edges.

Trotter also does not teach or suggest the feature of the present invention that is defined in the last clause of claim 1, i.e., that the second mechanical connection enables the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip. This claimed function is simply not possible in the floor system disclosed by Trotter. Trotter's system cannot be easily taken up after it is installed. Subsequent to the

assembly of the Trotter floor system, the cleats 39 will effectively engage the sides of the locking grooves, whereby any attempt to turn a floor panel upwards will fail.

Accordingly, it should now be clear that the system of Trotter is completely different from that of the present invention. The Trotter patent does not teach or suggest several of the important features that are defined in claim 1. Accordingly, the Examiner is respectfully urged to reconsider and withdraw the rejection of claim 1 based on Trotter.

In view of the differences in the objects and performance of the claimed floor system and the Trotter floor system, it should also be clear that the claimed invention defined in claim 1 is also not obvious in view of Trotter. Accordingly, the Examiner is respectfully requested to withdraw the rejection of claim 1 based on Trotter.

The Examiner, in an Office action dated January 6, 1997 and responding to the response on October 15, 1996, stated:

Claim Objections

1. Claims 1-11 and 13-20 are objected to because of the following informalities the applicant is reminded to be consistent with the verb tense used in the claims (i.e. providing, forming, comprising, etc.). Appropriate correction is required.

2. As per conversation with Mr. William C. Rowland on 12/16/96, the examiner suggests that "locking

device" in claim 1, line 13, be substituted with - building panels-.

Claim Rejections - 35 USC § 112

3. Claims 1-11 and 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation of "adjacent joint edges", in claim 1, line 4, is repetitious and ultimately confusing because it is not clear if applicant is introducing a second "adjacent joint edge" or if he is merely building upon the "adjacent joint edge" mentioned in line 2. If applicant is intending to build on the specifics of the "adjacent joint edge" in line 2 of the claims's preamble, - said - should precede the introduction thereof to better clarify the claim. The phrases "termed groove panel" and "termed strip panel" are not clear. If it is the applicant's intent to introduce two separate panels - a groove panel and a strip panel- he should introduce them initially in the preamble to better clarify the claim and then build upon the specifics of each individual panel. The examiner suggests that in order to make a distinction between the two panels, the applicant delete the phrases "termed groove panel" and "termed strip panel" and insert - a groove panel and a strip panel - after "comprising" in line 3 of claim 1; and continue with the description thereof throughout the claims for clarity.

Allowable Subject Matter

4. The examiner is withholding the previous indication of allowance until the 35 USC § 112 problems indicated above are cleared.

5. Claims 1-20 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112 set forth in this Office action.

6. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the use of adjacent joint floor paneling wherein the floor panels are interconnected by a locking element located within a groove formed on the underside in such a way so as to allow for displacement of the panels in a direction toward the joints and to allow for the locking member to be released from the groove when the panel is rotated about the joint.

92. Applicant, in a response to the Office action of January 6, 1997, and received in the Patent Office on June 6, 1997, amended claim 1-5, 7, 9-12, 16 and 18-19 as follows:

1. (Twice Amended) A system for providing a joint [along adjacent joint edges of two] between adjacent building panels, [especially floor panels,] comprising:

[adjacent joint edges together form a first mechanical connection] each of said building panels including a first edge and a second edge such that the first edge of each of said building panels forms a first mechanical connection with the second edge of an adjacent one of the building panels locking the first

and second [joint] edges of the building panels to each other in a first direction at right angles to a principal plane of the panels, and

a locking device arranged on a rear side of the building panels [forms] forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right angles to the [joint] first and second edges, said locking device [comprising] fitting within a locking groove [which extends] extending parallel to and spaced apart from the [joint] first edge of [one of] said building panels, [termed groove panel,] and which locking groove is open at the rear side of the [groove panel] building panels,

the locking device [further comprises] comprising a strip integrated with [another] the second edge of each of said building panels, [termed strip panel,] said strip extending throughout substantially an entire length of the [joint] second edge [of the strip panel] and being provided with a locking element projecting from the strip, such that when [the] two adjacent building panels are joined together, the strip projects from the rear side of the [groove panel] second edge of the panels with its locking element received in the locking groove of [the groove] an adjacent building panel,

the building panels, when joined together can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the [joint] first and second edges and is operative in said second mechanical connection,

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the [joint] first and second edges, and

the second mechanical connection enables the locking element to leave the locking groove if the [groove] respective building panel is turned about its [joint] first edge angularly away from the strip.

2. (Twice Amended) A system as claimed in claim 1, wherein when the [groove panel] first edge is pressed against the [strip] second edge of the adjacent panel in said second direction and is turned angularly away from the strip, the maximum distance between the axis of rotation of the first edge [groove panel] and the locking surface of the locking groove closet to the [joint] first and second edges is such that the locking element can leave the locking groove without contacting the locking surface of the locking groove.

Claim 3, line 3, change "the" to -a-.

4. (Twice Amended) A system as claimed in claim 1, wherein the first mechanical connection is provided by the first edge [of the groove panel] engaging, in said first direction, between the [joint] second edge of the [strip] adjacent panel and [the] a front side of the strip.

5. (Twice Amended) A System as claimed in claim 1, wherein the strip [integrated with the strip panel] is made of a material different from that of the [strip] panel and fixedly mounted on the [strip] panel at the factory.

7. (Twice Amended) A system as claimed in claim 5, wherein

the strip is mounted in an equalising groove which is countersunk in the rear side of the [strip] panel and exhibits an exact, predetermined distance from its bottom to the front side of the [strip] panel.

the part of the strip projecting behind the [groove] adjacent panel engages a corresponding equalising groove which is countersunk in the rear side of the [groove] adjacent panel and which exhibits the same exact, predetermined distance from its bottom to the front side of this [groove] adjacent panel, and

the strip has at least such a thickness that the rear side of the strip is flush with the rear sides of the panels.

Claim 9, line 3, delete "strip".
Claim10, line 3, delete "strip (second occurrence);
line 5, delete "strip".
Claim 11, line 3, delete "strip" (second occurrence);
Line 4, delete "strip".
Claim 12, line 3, delete "strip".

16. (Twice Amended) A system as claimed in claim 1, wherein the panels are rectangular and intended, at each of their four edges, to be joined to a similar panel by a first mechanical connection of the aforementioned type and a second mechanical connection of the aforementioned type, each panel having a first pair of [opposite joint] first and second edges, one of which is provided with a strip of the

aforementioned type and the other of which is provided with a locking groove of the aforementioned type, and a second pair of opposite [joint] first and second edges, one of which is provided with a strip of the aforementioned type and the other of which is provided with a locking groove of the aforementioned type.

Claim 18, line 6, delete "joint" and insert - - first and second - -.

Claim 19, line 5, delete "joint" and insert - - first - -;

line 6, delete "groove" and insert - -adjacent- -.

Please add the following new claims 21-23:

- - 21. A system for providing a joint between adjacent building panels, comprising:

each of said building panels including a first edge and a second edge such that the first edge of each of said building panels forms a first mechanical connection with the second edge of an adjacent one of the building panels locking the first and second edges of the building panels to each other in a first direction at right angles to a principal plane of the panels, and

a locking device arranged on a rear side of the building panels forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right angles to the first and second edges, said locking device fitting within a locking groove

extending parallel to and spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the building panels,

the locking device comprising a strip integrally formed with the second edge of each of said building panels, said strip extending throughout substantially an entire length of the second edge and being provided with a locking element projecting from the strip, such that when two adjacent building panels are joined together, the strip projects from the rear side of the second edge of the panels with its locking elements received in the locking groove of an adjacent building panel,

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the first and second edges, and

the second mechanical connection enables the locking element to leave the locking groove of an adjacent building panel,

22. A system for providing a joint between adjacent building panels, comprising:

each of said building panels including a first edge and a second edge such that the first edge of each of said building panels forms a first mechanical connection with the second edge of an adjacent one of the building panels locking the first and second edges of the building panels to each other in a first direction at right angles to a principal plane of the panels, and

a locking device arranged on a rear side of the building panels forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right angles to the first and second edges, said locking device fitting within a locking groove extending parallel to and spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the building panels,

the locking device comprising a strip integrated with the second edge of each of said building panels, said strip extending throughout substantially an entire length of the second edge and being provided with a locking element projecting from the strip, such that when two adjacent building panels are joined together, the strip projects from the rear side of the second edge of the panels with its locking element received in the locking groove of an adjacent building panel,

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the first and second edges, and

the second mechanical connection enables the locking element to leave the locking groove if the respective building panel is turned about its first edge angularly away from the strip.

23. A system for providing a joint between adjacent building panels, comprising:

each of said building panels including a first edge and a second edge such that the first edge of each of said building panels forms a first mechanical

connection with the second edge of an adjacent one of the building panels locking the first and second edges of the building panels to each other in a first direction at right angles to a principal plane of the panels, and

a locking device arranged on a rear side of the building panels forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right angles to the first and second edges, said locking device fitting within a locking groove extending parallel to and spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the building panels.

the locking device comprising a strip integrated with the second edge of each of said building panels, said strip being provided with a locking element projecting from the strip, such that when two adjacent building panels are joined together, the strip projects from the rear side of the second edge of the panels with its locking element, received in the locking groove of an adjacent building panel,

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the first and second edges, and

the second mechanical connection enables the locking element to leave the locking groove if the respective building panel is turned about its first edge angularly way from the strip;

wherein the strip is mounted in an equalizing groove which is countersunk in the rear side of each

of the building panels and exhibits an exact, predetermined distance from its bottom to the front side of a panel,

the part of the strip projecting behind the adjacent panel engages a corresponding equalising groove which is countersunk in the rear side of the adjacent panel and which exhibits the same exact, predetermined distance from its bottom to the front side of the adjacent panel, and

the strip has at least such a thickness that the rear side of the strip is flush with the rear sides of the panels. - -

In the remarks accompanying the amendment of June 6, 1997, it was stated it part:

To further define the protection to which applicant is entitled, new claims 21-23 are submitted herewith. New independent claim 21 is substantially similar to claim 1 except that it defines the strip as being integrally formed with the second edge of each of the building panels. Accordingly, claim 21 is also in condition for allowance.

New independent claim 22 is substantially the same as independent claim 1 except that it does not define the play that exists between the locking groove and the locking surface. As such, displacement of the panels is still facilitated in a direction along the joints which is what is believed to be meant by the Examiner's Statement of Reasons for the indication of allowable subject matter. Accordingly, claim 22 is also patentable over the cited prior art.

> New independent claim 23 is similar to dependent claim 7 rewritten in independent form, except that it has omitted a couple of details of the original claim 1. Nevertheless, it is clear that the subject matter of new independent claim 23 is clearly patentable over the cited prior for the same reasons that apply to claim 1. Accordingly, new independent claim 23 is also in condition for allowance.

93. The Examiner, in response to the amendment of June 6, 1997, issued a notice of allowability of claims 1-23 on July 7, 1997. (CX-123).

94. The '621 patent issued on January 13, 1998. The abstract of said patent (CX-1) is substantially identical to the abstract of the '907 patent, the only difference being that the last sentence of the abstract states "connections" rather than "connection."

E. Prosecution Of The '907 Patent

95. The application, viz. Ser. No. 09/193,687, leading to the '907 patent was filed on November 18, 1998, as a continuation of the application which led to the '267 patent. An originally filed claim in the '907 application was an apparatus claim. It was rejected in an initial office action on the basis of double patenting in view of the '621 patent. (CX-6 at LEW 04369). That claim was withdrawn and a new set of claims, all method claims, was filed. (CX-6 at LEW 04372-79). The PTO then issued a Notice of Allowability on September 13, 1999. (CX-6 at LEW 04438-40).

96. In an office action dated September 13, 1999 (RX-1365), the Examiner gave the following statement of reasons for the indication of allowable subject matter:

3. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the method for laying and mechanically joining parallel rows of rectangular building panels; wherein when the panels are interlocked, they are mechanically locked in a first direction that is at right angle to the plane of the panels, they are mechanically locked in a second direction that is at a right angle to the adjacent joint edges and to the first mechanically locked direction, such that when the panels are interlocked they can still [be] displaced in a direction adjacent the joint edges.

F. Prosecution Of The '410 Patent

97. The application for the '410 patent, viz., 09/356,563, was filed on July 19, 1999, as a continuation of application. no. 09/193,687 which issued as the '907 patent. The claims presented for examination in the Preliminary Amendment filed October 28, 1999 only included apparatus claims. (CX-7 at VA 06379-93). Those claims were rejected in an initial office action dated November 10, 1999, on the basis of double patenting in view of the '621 patent which issued on January 13, 1998. (CX-7 at VA 06394-97). A terminal disclaimer was filed to overcome the double patenting rejection. (CX-7 at VA 06403-04; VA 06412-13).

98. The '410 application was assigned to the same examiner who examined the '621, '267, and '907 patents, and was allowed without any substantive rejection of the claims. (RX-6; RX-1; RX-2; RX-3; CX-123; RX-1365; RX-1362).

99. The '410 application presented claims directed to an edge lock which locks the panels in a one-way horizontal

direction but must be rotated (turned angularly) to be released. (RX-3; RX-6).

100. One of the claims of the '410 patent, viz., dependent claim 49, mentions the word "play". (CX-5).

101. The Examiner, in a notice of allowability dated February 9, 2000, gave the following statement of reasons for the indication of allowable subject matter (CX-7 at VA06418):

> 2. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the use of a flooring system having a plurality of panels with a first mechanical locking that locks the panels together vertically, a second locking means that lock together horizontally, and a flexible locking strip that further locks the adjacent panels on the underside thereof in a one-way horizontal direction such that the panels have to undergo an angular turning in order to be released one from the other.

A notice of allowance issued on February 11, 2000 (CX-7 at VA 06419).

G. Prosecution Of The '267 Patent

102. The application, viz., Ser. No. 09/003,499, that issued as the '267 patent was filed on January 6, 1998, as a divisional application of the application issuing as the '621 patent. (CX-8).

103. An interview was held with the Examiner on October 14, 1998. New art to be made of record and prosecution in

foreign applications were discussed. As to the general nature of what was agreed to, it was stated:

> The Examiner agreed with the proposed changes to correct the 35 U.S.C. 112 problems to prepare claims 20-39 for allowance already made of record. New claims 40-61 were discussed with proposed amendments that would prepare them for allowance over the prior art already made of record. Further consideration will be made upon submission of the changes discussed and consideration of the newly submitted art.

(CX-8 at LEW 00072).

104. The dependent claims were then rewritten, the formal objections were overcome and new claims were added for the Examiner's consideration in a response received October 2, 1998. In the accompanying remarks it was stated in pertinent part (CX-8 at LEW00103):

> The foregoing amendments incorporate all of the corrections and changes requested by the Examiner during the interview on October 14, 1998. Accordingly, the amendments overcome the pending rejections.
>
> The new independent claims are similar to the pending independent claims, except that they do not use "long" and "short" to distinguish the different edges. The purpose of the new claims is to also cover a situation in which the short edges are connected first and the long edges are connected second, or wherein all of the edges are the same length. As a result of this change, it was also necessary to remove a reference to

the "second row" and three references to "longitudinal",

Other changes were made to clarify the claim language. For example, in some cases, "direction" was clarified or further defined.

105. An information disclosure statement was filed on October 14, 1998. (CX-8 at LEW O0075-80).

106. The Examiner issued a notice of allowance on November 3, 1998. (CX-8 at LEW00108)

H. The Title Pages And Specifications Of The Patents In Issue

107. Each of the '267 patent, the '907 patent and the '410 patent is based on essentially the same specification. (CX-3, CX-4, CX-5).

108. The abstracts of each of the patents in issue differ. Thus the abstract of the '267 patent reads:

A method for laying and mechanically joining rectangular building panels in parallel rows includes the steps of (a) placing a new one of the panels adjacent to a long edge of a previously laid first one of the panels in a first row and to a short edge of a previously laid second one of the panel is in an adjacent second row, such that the new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position relative to said second panel and such that the long edge of the

new panel is provided with a locking groove which is placed upon and in contact with a locking strip at the adjacent long edge of the first panel; (b) subsequently angling down the new one of the panels so as to accommodate a locking element of the strip of the first panel in the locking groove of the new panel, whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked together in a first direction also; and (c) displacing the new one of the panels in its longitudinal direction relative to the first panel towards a final longitudinal position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of the other one of the short edges, whereby the new one of the panels and the second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected short edges.

The abstract of the '907 patent reads:

> The invention relates to a system for laying and mechanically joining building panels, especially thin, hard, floating floors. Adjacent joint edges (3, 4) of two panels (1, 2) engage each other to provide a first mechanical connection locking the joint edges (3, 4) in a first direction (D1) perpendicular to the principal plane of the panels. In each joint, there is further provided a strip (6) which is integrated with one joint edge (3) and which projects behind the other joint edge (4). The strip (6) has an upwardly protruding

> locking element (8) engaging in a locking groove (14) in the rear side (16) of the other joint edge (4) to form a second mechanical connection locking the panels (1, 2) in a second direction (D2) parallel to the principal plane of the panels and at right angles to the joint. Both the first and the second mechanical connection allow mutual displacement of joined panels (1, 2) in the direction of the joint.

The abstract of the '410 patent reads:

> An edge lock is provided for use in a flooring system having a plurality of floor panels. The edge lock mechanically and releasably locks together adjacent edges of pairs of adjacent floor panels during assembly of the flooring system, and when said adjacent floor panels are laying flat on a subfloor with upper corner portions of said adjacent edges being mutually spaced apart, the edge lock includes a lock for forming a first mechanical connection for locking the adjacent edges to each other in a vertical direction, and for forming a second mechanical connection for locking the adjacent edges to each other in a horizontal direction at right angles to the edges. The lock includes a locking groove extending parallel to and spaced from a first one of the adjacent edges of one of the adjacent floor panels and being open at a rear side of the one adjacent floor panel, and a flexible and resilient locking strip integrated with another of the adjacent floor panels.

109. The specification, (SPECIFICATION) common to the three patents in issue, under the subheading "Technical Field" states in part (CX-3, col. 1, lns. 8-25):

The invention generally relates to a system for providing a joint along adjacent joint edges of two building panels, especially floor panels.

More specifically, the joint is of the type where the adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, and where a locking device forms a second mechanical connection locking the panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges, the locking device comprising a locking groove which extends parallel to and spaced from the joint edge of one of the panels, and said locking groove being open at the rear side of this one panel.

110. The SPECIFICATION, under the subheading "Background Of The Invention," states (CX-3, col. 1, lns. 32-63):

A joint of the aforementioned type is known, e.g. from SE 450,141. The first mechanical connection is achieved by means of joint edges having tongues and grooves. The locking device for the second mechanical connection comprises two oblique locking grooves, one in the rear side of each panel, and a plurality of spaced-apart spring clips which are distributed along the joint and the legs of which are pressed into the grooves, and which are biased so as to tightly clamp the floor panels together. Such a joining technique is especially useful for joining thick floor panels to form surfaces of a considerable expanse.

> Thin floor panels of a thickness of about 7—10 mm, especially laminated floors, have in a short time taken a substantial share of the market. All thin floor panels employed are laid as "floating floors" without being attached to the supporting structure. As a rule, the dimension of the floor panels is 200x1200 mm, and their long and short sides are formed with tongues and grooves. Traditionally, the floor is assembled by applying glue in the groove and forcing the floor panels together. The tongue is then glued in the groove of the other panel. As a rule, a laminated floor consists of an upper decorative wear layer of laminate having a thickness of about 1 mm, an intermediate core of laminate board Cr *ss* other board, and a base layer to balance the construction. The core has essentially poorer properties than the laminate, e.g in respect of hardness and water resistance, but it is nonetheless needed primarily for providing a groove and tongue for assemblage. This means that the overall thickness must be at least about 7 mm. These known laminated floors using glued tongue-and-groove joints however suffer from several inconveniences.

111. The following "inconveniences" of the prior art laminated floors using glued tongue- and-groove joints were listed under "Background Of The Invention" (CX-3, col. 1, ln. 64- col. 2, ln 43):

> First, the requirement of an overall thickness of at least about 7 mm entails an undesirable restraint in connection with the laying of the floor, since it is easier to cope with low thresholds when using thin floor panels, and doors must often be adjusted in height to come clear of the floor laid. Moreover,

manufacturing costs are directly linked with the consumption of material.

Second, the core must be made of moisture-absorbent S material to permit using water-based glues when laying the floor. Therefore, it is not possible to make the floors thinner using so-called compact laminate, because of the absence of suitable gluing methods for such non-moisture-absorbent core materials.

Third, since the laminate layer of the laminated floors is highly wear-resistant, tool wear is a major problem when working the surface in connection with the formation of the tongue.

Fourth, the strength of the joint, based on a glued tongue-and-groove connection, is restricted by the properties of the core and of the glue as well as by the depth and height of the groove. The laying quality is entirely dependent on the gluing. In the event of poor gluing, the joint will open as a result of the tensile stresses which occur e.g. in connection with a change in air humidity.

Fifth, laying a floor with glued tongue-and-groove joints is time-consuming, in that clue must be applied to every panel on both the long and short sides thereof.

Sixth, it is not possible to disassemble a glued floor once laid, without having to break up the joints. Floor panels that have been taken up cannot therefore be used again. This is a drawback particularly in rental houses where the flat concerned must be put back into the initial state of occupancy. Nor can damaged or

worn-out panels be replaced without extensive efforts, which would be particularly desirable on public premises and other areas where parts of the floor are subjected to great wear.

Seventh, known laminated floors are not suited for such use as involves a considerable risk of moisture penetrating down into the moisture-sensitive core.

Eighth, present-day hard, floating floors require, prior to laying the floor panels on hard subfloors, the laying of a separate underlay of floorboard, felt, foam or the like, which is to damp impact sounds and to make the floor more pleasant to walk on. The placement of the underlay is complicated operation, since the underlay must be placed in edge-to-edge fashion. Different under-lays affect the properties of the floor.

112. Under "Background Of The Invention", and as to the prior art, the SPECIFICATION states (CX-3, col. 2, ln. 44-col. 4, ln. 20):

There is thus a strongly-felt need to overcome the above-mentioned drawbacks of the prior art. It is however not possible simply to use the known joining technique with glued tongues and grooves for very thin floors, e.g. with floor thicknesses of about 3 mm, since a joint based on a tongue-and-groove connection would not be sufficiently strong and practically impossible to produce for such thin floors. Nor are any other known joining techniques usable for such thin floors. Another reason why the making of thin floors from e.g. compact laminate involves problems is the thickness tolerances of the panels, being about 0.2—0.3 mm for a panel thickness or about 3 mm. A

3-mm compact laminate panel having such a thickness tolerance would have, if ground to uniform thickness on its rear side, an unsymmetrical design, entailing the risk of bulging. Moreover, if the panels have different thicknesses, this also means that the joint will be subjected to excessive load.

Nor is it possible to overcome the above-mentioned problems by using double-adhesive tape or the like on the undersides of the panels, since such a connection catches directly and does not allow for subsequent adjustment of the panels as is the case with ordinary gluing.

Using U-shaped clips of the type disclosed in the above-mentioned SE 450,141, or similar techniques, to overcome the drawbacks discussed above is no viable alternative either. Especially biased clips of this type cannot be used for joining panels of such a small thickness as 3 mm. Normally, it is not possible to disassemble the floor panels without having access to their undersides. This known technology relying on clips suffers from the additional drawbacks:

Subsequent adjustment of the panels in their longitudinal direction is a complicated operation in connection with laying, since the clips urge the panels tightly against each other.

Floor laying using clips is time-consuming.

This technique is usable only in those cases where the floor panels are resting on underlying joists with the clips placed there between. For thin floors to be laid on a

> continuous, flat supporting structure, such clips cannot be used.
>
> The floor panels can be joined together only at their long sides. No clip connection is provided on the short sides.

113. The SPECIFICATION under the subheading "Technical Problems And Objects Of The Invention" states the following objects (CX-3, col. 3 lns. 22-54)

> A main object of the invention therefore is to provide a system for joining together building panels, especially floor panels for hard, floating floors, which allows using floor panels of a smaller overall thickness than present-day floor panels.
>
> A particular object of the invention is to provide a panel-joining system which
>
> makes it possible in a simple, cheap and rational way to provide a joint between floor panels without requiring the use of glue, especially a joint based primarily only on mechanical connections between the panels;
>
> can be used for joining floor panels which have a smaller thickness than present-day laminated floors and which have, because of the use of a different core material, superior properties than present-day floors even at a thickness of 3 mm;
>
> makes it possible between thin floor panels to provide a joint that eliminates any unevennesses in the joint because of thickness tolerances of the panels;

allows joining all the edges of the panels; reduces tool wear when manufacturing floor panels with hard surface layers;

allows repeated disassembly and reassembly of a floor previously laid, without causing damage to the panels, while ensuring high laying quality;

makes it possible to provide moisture-proof floors; makes it possible to obviate the need of accurate, separate placement of an underlay before laying the floor panels; and

considerably cuts the time for joining the panels.

114. The SPECIFICATION, under the subheading "Technical Problems And Objects Of The Invention," discloses, as to how the objects are achieved, the following (CX-3, col. 3, ln. 55-col. 4, ln. 49):

These and other objects of the invention are achieved by means of a panel-joining system having the features recited in the pended claims.

Thus, the invention provides a system for making a joint along adjacent joint edges of two building panels, especially floor panels, in which joint:

the adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, and

a locking device arranged on the rear side of the panels forms a second mechanical connection locking

the panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges, said locking device comprising a locking groove which extends parallel to and spaced from the joint edge of one of said panels, termed groove panel, and which is open at the rear side of the groove panel, said system being characterised in

that the locking device further comprises a strip integrated with the other of said panels, termed strip panel, said strip extending throughout substantially the entire length of the joint edge of the strip panel and being provided with a locking element projecting from the strip, such that when the panels are joined together, the strip projects on the rear side of the groove panel with its locking element received the locking groove, of the groove panel,

that the panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection,

that the first and the second mechanical connection both allow mutual displacement of the panels in the direction of the joint edges, and

that the second mechanical connection is so conceived as to allow the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip.

> The term "rear side" as used above should be considered to comprise any side of the panel located behind/underneath the front side of the panel. The opening plane of the locking groove of the groove panel can thus be located at a distance from the rear surface of the panel resting on the supporting structure. Moreover, the strip, which in the invention extends throughout substantially the entire length of the joint edge of the strip panel, should be considered to encompass both the case where the strip is a continuous, uninterrupted element and the case where the "strip" consists in its longitudinal direction of several parts, together covering the main portion of the joint edge.
>
> It should also be noted (i) that it is the first the second mechanical connection as such that permit mutual displacement of the panels in the direction of the joint edges, and that (ii) it is the second mechanical connection as such that permits the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip. Within the scope of the invention, there may thus exist means, such as glue and mechanical devices, that can counteract or prevent such displacement and/or upward angling. [Emphasis added]

The word "play" is found in the SPECIFICATION in the above emphasized portion.

115. The SPECIFICATION, under the subheading "Technical Problems And Objects Of The Invention", discloses what the system makes possible (CX-3, col. 4, lns. 50-col. 5, ln. 29):

The system according to the invention makes it possible to provide concealed, precise locking of both the short and long sides of the panels in hard, thin floors. The floor panels can be quickly and conveniently disassembled in the reverse order of laying without any risk of damage to the panels, ensuring at the same time a high laying quality. The panels can be assembled and disassembled much faster than in present-day systems, and any damaged or worn-out panels can be replaced by taking up and re-laying parts of the floor.

According to an especially preferred embodiment of the invention, a system is provided which permits precise joining of thin floor panels having, for example, a thickness of the order of 3 mm and which at the same time provides a tolerance-independent smooth top face at the joint. To this end, the strip is mounted in an equalising groove which is countersunk in the rear side of the strip panel and which exhibits an exact, predetermined distance from its bottom to the front side of the strip panel. The part of the strip projecting behind the groove panel engages a corresponding equalising groove, which is countersunk in the of the groove panel and which exhibits the same exact, predetermined distance from its bottom to the front side of the groove panel. The thickness of the strip is at least so great that the rear side of the strip is flush with, and preferably projects slightly below the rear side of the panels. In this embodiment, the panels will always rest, in the joint, with their equalising grooves on a strip. This levels out the tolerance and imparts the necessary strength to the joint. The strip transmits horizontal and upwardly-

directed fores to the panels and downwardly-directed forces to the existing subfloor.

Preferably, the strip may consist of a material which is flexible, resilient and strong, and can be sawn. A preferred strip material is sheet aluminum. In an aluminum strip, sufficient strength can be achieved with a strip thickness of the order of 0.5 mm.

In order to permit taking up previously laid, joined floor panels in a simple way, a preferred embodiment of the invention is characterised in that when the groove panel is pressed against the strip panel in the second direction and is turned angularly away from the strip, the maximum distance between the axis of rotation of the groove panel and the locking surface of the locking groove closest to the joint edges is such that the locking element can leave the locking groove without contacting the locking surface of the locking groove. Such a disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm. [Emphasis added]

The word "play" is found in the SPECIFICATION in the above emphasized portion.

116. Under the subheading "Technical Problems And Objects Of The Invention," the SPECIFICATION states (CX-3, col. 5, ln. 30-col. 6, ln. 17):

According to the invention, the locking surface of the locking element is able to provide a sufficient locking function even with very small heights of the locking surface. Efficient locking of 3-mm floor panels can be

achieved with a locking surface that is as low as 2 mm. Even a 0.5-mm-high locking surface may provide sufficient locking. The term "locking surface" as used herein relates to the part of the locking element engaging the locking groove to form the second mechanical connection.

For optimal function of the invention, the strip and the locking element should be formed on the strip panel with high precision. Especially, the locking surface of the locking element should be located at an exact distance from the joint edge of the strip panel.

Furthermore, the extent of the engagement in the floor panels should be minimised, since it reduces the floor strength.

By known manufacturing methods, it is possible to produce a strip with a locking pin, for example by extruding aluminum or plastics into a suitable section, which is thereafter glued to the floor panel or is inserted in special grooves. These and all other traditional methods do however not ensure optimum function and an optimum level of economy. To produce the joint system according to the invention, the strip is suitably formed from sheet aluminum, and is mechanically fixed to the strip panel.

The laying of the panels can be performed by first placing the strip panel on the subfloor and then moving the groove panel with its long side up to the long side of the strip panel, at an angle between the principal plane of the groove panel and the subfloor. When the joint edges have been brought into engagement with each other to form the first

mechanical connection, the groove panel is angled down so as to accommodate the locking element in the locking groove.

Laying can also be performed by first, placing both the strip panel and the groove panel flat on the subfloor and then joining the panels parallel to their principal planes while bending the strip downwards until the locking element snaps up into the locking groove. This laying technique enables in particular mechanical locking of both the short and long sides of the floor panels. For example, the long sides can be joined together by using the first laying technique with downward angling of the groove panel, while the short sides are subsequently joined together by displacing the groove panel in its longitudinal direction until its short side is pressed on and locked to the short side of an adjacent panel in the same row.

In connection with their manufacture, the floor panels can be provided with an underlay of e.g. floor board, foam or felt. The underlay should preferably cover the strip such that the joint between the underlays is offset in relation to the joint between the floor panels.

The above and other features and advantages of the invention will appear from the appended claims and the following description of embodiments of the invention.

117. The SPECIFICATION, under the subheading "Description Of Drawing Figures," states (CX-3, col. 6, lns. 23-42):

FIGS. 1a and 1b schematically show in two stages how two floor panels of different thickness are joined together in floating fashion according to a first embodiment of the invention.

FIGS. 2a-c show in three stages a method for mechanically joining two floor panels according to a second embodiment of the invention.

FIGS. 3a-c show in three stages another method for mechanically joining the floor panels of FIGS. 2a-c.

FIGS. 4a and 4b show a floor panel according to FIGS. 2a-c as seen from below and from above, respectively.

FIG. 5 illustrates in perspective a method for laying and joining floor panels according to a third embodiment of the invention.

FIG. 6 shows in perspective and from below a first variant for mounting a strip on a floor panel.

FIG. 7 shows in section a second variant for mounting a strip on a floor panel.

118. The SPECIFICATION, under the subheading "Description Of Preferred Embodiments" and referring to FIGS. 1a and 1b and FIGS. 4a and 4b states (CX-3, col. 6, ln. 45-col. 8, ln. 27):

FIGS. 1a and 1b, to which reference is now made, illustrate a first floor panel 1, hereinafter termed strip panel, and a second floor panel 2, hereinafter termed groove panel. The terms "strip panel" and "groove

panel" are merely intended to facilitate the description of the invention, the panels 1, 2 normally being identical in practice. The panels 1 and 2 may be made from compact laminate and may have a thickness of about 3 mm with a thickness tolerance of about. +-.0.2 mm. Considering this thickness tolerance, the panels 1, 2 are illustrated with different thicknesses (FIG. 1b), the strip panel 1 having a maximum thickness (3.2mm) and the groove panel 2 having a minimum thickness (2.8 mm).

To enable mechanical joining of the panels 1, 2 at opposing joint edges, generally designated 3 and 4, respectively, the panels are provided with grooves and strips as described in the following.

Reference is now made primarily to FIGS. 1a and 1b, and secondly to FIGS. 4a and 4b showing the basic design of the floor panels from below, and from above, respectively.

From the joint edge 3 of the strip panel 1, i.e. the one long side, projects horizontally a flat strip 6 mounted at thee factory on the underside of the strip panel 1 and extending throughout the entire edge 3. The strip 6, which is made of flexible, resilient sheet aluminum, can be fixed mechanically, by means of clue or in any other suitable a way. In FIGS. 1a and 1b, the strip 6 is glued, while in FIGS. 4a and 4b it is mounted by means of a mechanical connection, which will be described in more detail herein below.

Other strip materials can be used, such as sheets of other metals, as well as aluminum or plastics sections. Alternatively, the strip 6 may be integrally formed

with the strip panel 1. At any rate, the strip 6 should be integrated with the strip panel 1 i.e. it should not be mounted on the strip panel 1 in connection with laying. As a non-restrictive example, the strip 6 may have a width of about 30 mm and a thickness of about 0.5 mm.

As appears from FIGS. 4a and 4b, a similar, although shorter strip 6' is provided also at one short side 3' of the strip panel 1. The shorter strip 6' does however not extend throughout the entire short side 3' but is otherwise identical with the strip 6 and, therefore, is not described in more detail here.

The edge of the strip 6 facing away from joint edge 3 is formed with a locking element 8 extended throughout the entire strip 6. The locking element 8 has a locking surface 10 facing the joint edge 3 and having a height of e.g. 0.5 mm. The locking element 8 is so designed that when the floor is being laid and the strip panel 2 of FIG. 1a is pressed with its joint edge 4 against the joint edge 3 of the strip panel 1 and is angled down against the subfloor 12 according to FIG. 1b, it enters a rocking groove 14 formed in the underside 16 of the groove panel 2 and extending parallel to and spaced from the joint edge 4. In FIG. 1b, the locking element 8 and the locking groove 14 together form a mechanical connection locking the panels 1, 2 to each other in the direction designated D2. More specifically, the locking surface 10 of the locking element 8 serves as a stop with respect to the surface of the locking groove 14 closest to the joint edge 4.

When the panels 1 and 2 are joined together, they can occupy such a relative position in the direction D2 that there is a small play Δ between the locking surface 10 and the locking groove 14. This mechanical connection in the direction D2 allows mutual displacement of the panels 1,2 in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action.

As appears from FIGS. 4a and 4b, each canal in the system has a strip 6 at one long side 3 and a locking groove 14 at the other long side 4, as well as a strip 6' at one short side 3' and a locking groove 14' at the other short side 4'.

Furthermore, the joint edge 3 of the strip panel 1 has in its underside 18 a recess 20 extending throughout the entire joint edge 3 and forming together with the upper face 22 off the strip 6 a laterally open recess 24. The joint edge 4 of the groove panel 2 has in its top side 26 a corresponding recess 28 forming a locking tongue 30 to be accommodated in the recess 24 so as to form a mechanical connection locking the joint edges 3, 4 to each other in the direction designated D1. This connection can be achieved with other designs of the joint edges 3, 4, for example by a bevel thereof such that the joint edge 4 of the groove panel 2 passes obliquely in underneath the joint, edge 3 of the strip panel 1 to be locked between that edge and the strip 6.

The panels 1, 2 can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again.

> The strip 6 is mounted in a tolerance-equalising groove 40 in the underside 18 of the strip panel 1 adjacent the joint edge 3. In this embodiment, the width of the equalising groove 40 is approximately equal to half the width of the strip 6, i.e. about 15 mm. By means of the equalising groove 40, it is ensured that there ill always exist between the top side 21 of the panel 1 and the bottom of the groove 40 an exact, predetermined distance E which is slightly smaller than the minimum thickness (2.8 mm) of the floor panels 1, 2. The groove panel 2 has a corresponding tolerance-equalising surface, or groove 42 in the underside 16 of the joint edge 4. The distance between the equalising surface 42 and the top side 26 of the groove panel 2 is equal to the aforementioned exact distance E. Further, the thickness of the strip 6 is so chosen that the underside 44 of the strip is situated slightly below the undersides 18 and 16 of the floor panels 1 and 2, respectively. In this manner, the entire joint will rest on the strip 6, and all vertical downwardly-directed forces will be efficiently transmitted to the subfloor 12 without any stresses being exerted on the joint edges 3, 4. Thanks to the provision of the equalising grooves 40, 42, an entirely even joint will be achieved on the top side, despite the thickness tolerances of the panels 1, 2, without having to perform any grinding or the like across the whole panels. Especially, this obviates the risk of damage to the bottom layer of the compact laminate, which might give rise to bulging of the panels. [Emphasis added]

The word "play" is found in the SPECIFICATION in the above emphasized portion.

119. The SPECIFICATION, under the subheading "Description Of Preferred Embodiment" and referring to FIGs. 2a-c, FIGs. 1a and 1b, FIG. 6 and FIG. 7, states (CX-3, col. 8, ln. 28- col. 9, ln. 13):

> Reference is now made to the embodiment of FIGs. 2a-c showing in a succession substantially the same laying method as in FIGs. 1a and 1b. The embodiment of FIGs. 2a-c primarily differs from the embodiment of FIGs. 1a and 1b in that the strip 6 is mounted on the strip panel 1 by means of a mechanical connection instead of glue. To provide this mechanical connection, illustrated in more detail in FIG. 6, a groove 30 is provided in the underside 18 of the strip panel 1 at a distance from the recess 24. The groove 50 may be formed either as a continuous groove extending throughout the entire length of the panel 1, or as a number of separate grooves. The groove 50 defines, together with the recess 24, a dovetail gripping edge 52, the underside of which exhibits an exact equalising distance E to the top side 21 of the strip panel 1. The aluminum strip 6 has a number of punched and bent tongues 54, as well as one or more lips 56 which are bent round opposite sides of the gripping edge 52 in clamping engagement therewith. This connection is shown in detail from below in the perspective view of FIG. 6.
>
> Alternatively, a mechanical connection between the strip 6 and the strip panel 1 can be provided as illustrated in FIG. 7 showing in section a cut-away part of the strip panel 1 turned upside down. In FIG. 7, the mechanical connection comprises a dovetail recess 53 in the underside 18 of the strip panel 1, as well as tongues/lips 60 punched and bent from the

strip 6 and clamping against opposing inner sides of the recess 58.

The embodiment of FIGs. 2a-c is further characterised in that the locking element 8 of the strip 6 is designed as a component bent from the aluminum sheet and having an operative locking surface 10 extending at right angles up from the front side 22 of the strip 6 through a height of e.g. 0.5 mm and a rounded guide surface 34 facilitating the insertion of the locking element 8 into the locking groove 14 when angling down the groove panel 2 towards the subfloor 12 (FIG. 2b), as well as a portion 36 which is inclined towards the subfloor 12 and which is not operative in the laying method illustrated in FIGs. 2a-c.

Further, it can be seen from FIGs. 2a-c that the joint edge 3 of the strip panel 1 has a lower bevel 70 which cooperates during laying with a corresponding upper bevel 72 of the joint edge 4 of the groove panel 2, such that the panels 1 and 2 are forced to move vertically towards each other when their joint edges 3, 4 are moved up to each other and the panels are pressed together horizontally.

Preferably, the locking surface 10 is so located relative to the joint edge 3 that when the groove panel 2, starting from the joined position in FIG. 2c, is pressed horizontally in the direction D2 against the strip panel 1 and is turned angularly up from the strip 6, the maximum distance between the axis of rotation A of the groove panel 2 and the locking surface 10 of the locking groove is such that the locking element 8 can leave the locking groove 14 without coming into contact with it.

120. The SPECIFICATION, under the subheading "Description Of Preferred Embodiments" and referring to FIGs. 2a-c and FIGs. 3a-3b, states (CX-3, col. 9 lns. 15-55):

> FIGs. 3a-3b show another joining method for mechanically joining together the floor panels of FIGs. 2a-c. The method illustrated in FIGs. 3a-c relies on the fact that the strip 6 is resilient and is especially useful for joining together the short sides of floor panels which have already been joined along one long side as illustrated in FIGs. 2a-c. The method of FIGs. 3a-c is performed by first placing the two panels 1 and 2 flat on the subfloor 12 and then moving them horizontally towards each other according to FIG. 3b. The inclined portion 36 of the locking element 6 then serves as a guide surface which guides the joint edge 4 of the groove panel 2 up on to the upper side 22 of the strip 6. The strip 6 will then be urged downwards while the locking element 8 is sliding on the equalising surface 42. When the joint edges 3, 4 have been brought into complete engagement with each other horizontally, the locking element 8 will snap into the locking groove 14 (FIG. 3c), thereby providing the same locking as in FIG. 2c. The same locking method can also be used by placing, in the initial position, the joint edge 4 of the groove panel with the equalising groove 42 on the locking element 10 (FIG. 3a). The inclined portion 36 of the locking element 10 then is not operative. This technique thus makes it possible to lock the floor panels mechanically in all directions, and by repeating the laying operations the whole floor can be laid without using any glue.
>
> The invention is not restricted to the preferred embodiments described above and illustrated in the

drawings, but several variants and modifications thereof are conceivable within the scope of the appended claims. The strip 6 can be divided into small sections covering the major part of the joint length. Further, the thickness of the strip 6 may vary throughout its width. All strips, locking grooves, locking elements and recesses are so dimensioned as to enable laying the floor panels with flat top sides in a manner to rest on the strip 6 in the joint. If the floor panels consist of compact laminate and if silicone or any other sealing compound, a rubber strip or any other sealing device is applied prior to laying between the flat projecting part of the strip 6 and the groove panel 2 and/or in the recess 26, a moisture-proof floor is obtained.

121. The SPECIFICATION, under the subheading "Description Of Preferred Embodiments" and referring to FIGs. 5 and 6, states (CX-3, col. 9, ln. 56- col. 10, ln. 34):

As appears from FIG. 6, an underlay 46, e.g. of floor board, foam or felt, can be mounted on the underside of the, panels during the manufacture thereof. In one embodiment, the underlay 46 covers the strip 6 up to the locking element 8, such that the joint between the underlay 46 becomes offset in relation to the joint between the joint edges 3 and 4.

In the embodiment of FIG. 5, the strip 6 and its locking element 8 are integrally formed with the strip panel 1, the projecting part of the strip 6 thus forming an extension of the lower part of the joint edge 3. The locking function is the same as in the embodiments described above. On the underside 18 of the strip panel 1, there is provided a separate strip, band or the

like 74 extending throughout the entire length of the joint and having, in this embodiment, a width covering approximately the same surface as the separate strip 6 of the previous embodiments. The strip 74 can be provided directly on the rear side 18 or in a recess formed therein (not shown), so that the distance from the front side 21, 26 of the floor to the rear aide 76, including the thickness of the strip 74, always is at least equal to the corresponding distance in the panel having the greatest thickness tolerance. The panels 1, 2 will then rest, in the joint, on the strip 74 or only on the undersides 18, 16 of the panels, if these sides are made plane.

When using a material which does not permit downward bending of the strip 6 or the locking element 8, laying can be performed in the way shown in FIG. 5. A floor panel 2a is moved angled upwardly with its long side 4a into engagement with the long side 3 of a previously laid floor panel 1 while at the same time a third floor panel 2b is moved with its short side 4b' into engagement with the short side 3a' of the upwardly-angled floor panel 2a and is fastened by angling the panel 2b downwards. The panel 2b is then pushed along the short side 3a' of the upwardly-angled floor panel 2a until its long side 4b encounters the long side 3 of the initially-laid panel 1. The two upwardly-angled panels 2a and 2b are therefore angled down on to the subfloor 12 so as to bring about locking.

By a reverse procedure the panels can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again.

Several variants of preferred laying methods are conceivable. For example, the strip panel can be inserted under the groove panel, thus enabling the laying of panels in all four directions with respect to the initial position.

I. Domestic Industry

122. Limbert, making no mention of whether the Pergo and Unilin products contained play, testified accordingly (Tr. at 820-26):

Q And do you have an opinion as to whether the limitations of claim 19 of the '267 patent can be found in the Unilin installation instructions?

A Yes, I do.

Q And do you provide that opinion and the basis for that opinion?

A Yes, it's my opinion that all the limitations found in claim -- found in claim 19 of the '267 patent are found in the Unilin Uniclic installation instructions. The basis for that opinion is illustrated in exhibit -- the exhibit on the left on the screen -- I don't see the number.

Q It's CX-125.

A And CX-125.

JUDGE LUCKERN: That's the exhibit number, isn't it, Doctor? That is the exhibit that you were referring to, correct?

THE WITNESS: Well I can't see the exhibit number on what I'm looking at, so I --

JUDGE LUCKERN: Oh. Make sure that he verifies what you said.
BY MR. O'BRIEN:

Q Can you turn to CX-125 in your book?

JUDGE LUCKERN: Apparently I can't find exhibit number on --

THE WITNESS: I'm dealing with three different exhibits.

JUDGE LUCKERN: Off the record.

JUDGE LUCKERN: Are back. Is that it, Doctor?

THE WITNESS: Yes.

JUDGE LUCKERN: And that's the exhibit number?

THE WITNESS: Yes, CX-125.

JUDGE LUCKERN: Thank you.

THE WITNESS: Can you repeat the question, please?

JUDGE LUCKERN: I'll repeat it, Doctor. Let me just -- let me give you paraphrased a series of questions.

Question: And do you have an opinion as to whether the limitations of claim 19 of the '267 patent can be found in the Unilin installation instructions?

Answer: Yes, I do.

And could you provide that opinion or would you provide that opinion or the basis for your opinion.

Yes, it's my opinion that all the limitations found -- that would be claim 19 of the '267 patent are found in the Unilin Uniclic installation instructions.

The basis for that opinion is illustrated in exhibit -- and they did -- we don't know the number, but we ended up, the exhibit would be what you later said is CX-125. And that's it. Did you have anything more to add to that answer?

THE WITNESS: Yes, Your Honor.

JUDGE LUCKERN: Go ahead.

THE WITNESS: The basis for that opinion is as follows: Claim 19 of the '267 patent describes a three-step method for laying and joining of rectangular panels. The first step involves placing a new one adjacent to a long edge, and displaced from a second panel, in the second row, and then step B involves angling the new one down to accommodate the

locking element in the strip to the locking groove of the new panel, and the third step involves placing the new panel in its longitudinal direction so that the short edges are -- become mechanically connected in the first and second directions.

The Exhibit CX-125 uses illustrations from the Uniclic website, and points out the first and second direction, points out the locking groove, locking element and locking strip, And then the Uniclic instructions illustrate step A, that is, placing the new one of the panels such that the new panel is placed upon the corresponding edge of the previous panel as illustrated in the figure labeled A.

Subsequently angling the new one down, step B, is illustrated in figure B of Exhibit CX-125.

Finally, the step of displacing the new one is described in the paragraph labeled B towards the bottom of Exhibit CX-125 along with the smaller illustration labeled B at the bottom of CX-125, where the instructions describe methods to connect the panels while laying flat.

Q Can you turn to CX-129? And what is CX-129?

A CX-129 is an exhibit that I prepared using iages from the Pergo Presto website and some text from the Pergo Presto installation instructions. And it compares those

instructions with the basic elements of claim 19 of the '267 patent.

Q Do you have an opinion as to whether the Pergo installation instructions are covered by claim 19 of the '267 patent?

A. I do.

Q. And would you state your opinion and provide the basis for it?

A. It is my opinion that all of the limitations of claim 19 are included in the Pergo Presto installation instructions. The basis for that is illustrated here in figure -- excuse me, in Exhibit CX-129, with the upper figure illustrating the structural parts of this method claim as well as the three steps of installation. First step A, placing a new one of the panel, placing upon a previously laid panel which is illustrated in the figure labeled E, subsequently angling down the new one; step B, which is illustrated in the next couple of illustrations.

And finally step C, displacing the new one where there is an illustration, it's either I or L, and the next the paragraph labeled L, where methods and techniques for displacing the new one into the -- in a plane, are described.

123. Limbert, concerning why he believed that the Unilin product infringe claims 1, 26 and 39 of the '410, testified (Tr. at 809-12):

Q Claim 1 is included as CX-176, for your reference. And could you state your opinion regarding the comparison between the Unilin product in claim 1 of the '410 patent and explain the basis for your opinion?

A Claim 1 of the '410 patent covers an edge lock for use in a flooring system that mechanically a releasable I locks together floor, adjacent floor panels when those panels are laying flat on a subfloor.

And the edge lock comprises a locking means for forming a first mechanical connection and a second mechanical connection, and which the Unilin Uniclic product does. The locking means that is described in claim 1 includes a locking groove extending parallel to a first edge, and the locking groove is pointed out in the upper right-hand photograph of CX-152.

The locking means also includes a flexible and resilient locking strip that also extends along most of the length of an edge, and that is illustrated in the upper left-hand corner of CX-152, at least for the short edges of the Uniclic product.

The locking means also requires that the locking strip have a locking element projecting from it, and that is also pointed out there the upper left-hand corner photograph of CX-152.

The locking means is further constructed so as to operate as a one-way snap lock when these panels are assembled in plane when the adjacent edges are displaced towards one another by resiliently -- pardon me, by moving or urging the lower resilient locking strip downwards until the upper corner portions of the

-- of the edges are brought into complete engagement and thereby the locking element snaps up into the locking groove, and that is illustrated in the third photograph in CX-152 where we have the adjoined short edges with the upper corner portions abutted and the locking element positioned now in the locking groove.

Finally, claim 1 requires that they be constructed as to enable those panels to be rotated about the upper corner portions of those locked-together edges in an angular direction to remove the locking element from the locking groove in order to unlock the one-way snap lock, and that is easily done with the Unilin Uniclic product.

Q I'd like you to make the same comparison with claim 26 of the '410 patent. If you could state your opinion and explain the basis for your opinion as to whether the limitations of claim 26 are found in the Unilin product.

A We pointed out the differences between claim 26 and claim 1 of the '410 patent, and -- yesterday, and the principal differences have to do with the assembly of the product when adjacent floor panels are already connected with another panel and are laying flat on the subfloor, and that there's no requirement for the edge to enable disassembly.

It is my opinion that all of the claims of claim 26 are - pardon me - all of the limitations of claim 26 of the '410 patent are found in the Unilin Uniclic product.

Q And I'd like you to turn to CX-178, and begin make the same comparison as to whether or not the limitations of claim 39 of the '410 patent are found in the Unilin product.

A Yesterday, we discussed the differences between claim 39 of the '410 patent and claim 1 of the '410 patent.

And claim 39 points out the long edges and short edges; it says that the first and second mechanical connections are constructed do allow mutual displacement in the direction of the long edges, and the second mechanical connection allows the locking element to be of the locking groove when one panel is rotated relative to the other.

It is my opinion that Unilin Uniclic product includes all of the limitations of claim 39 of the '410 patent.

Q Now, do you have an opinion as to whether or not the structure of the Pergo product is the same as the structure of the Unilin product with reference to the claims we've been discussing?

A Yes, I do.

Q And what is your opinion comparing the structure of the Pergo product with the structure of the Unilin product?

A The Pergo product has all of the same structures in almost the same way, almost exactly the same way as the Unilin Uniclic product. And I believe that it's licensed from Unilin.

Q So is your opinion any different or the bases for your opinion with respect to Pergo any different than the Opinions which you have just provided with respect to Unilin?

A Well, my bases would include the -- for the Pergo product would include their product as opposed to the Unilin product, but it was my opinion that the Pergo Presto product is covered by all the claims, all the limitations of claim 1, 26 and 39 of the '410 patent.

Q And are there any other reasons than that which you have provided with respect to the Unilin product?

A Not that I'm recalling.

J. Embodiments

124. Concerning whether or not play could be detected in a joint by seeing the play, Tony Pervan testified:

Q And if you don't see play, you don't have play?

A Okay. You're very trustworthy to the engineering of my methods. But, still, I can't exclude play in any way because I don't see it. That is too much to say.

But if I see play I trust, if I couldn't – if I could find play with this method, that then there is a play. But if you don't notice any play, that is not evidence that the joint doesn't have play, you can't exclude play with this method, because it still it's a very sensitive operation. To brush away all the fibers, you

could have fibers stuck in the small, you know, play is very, very tiny, very tiny gap. It could be actually from zero to, well, 0.2 millimeters, that is nothing, that is a hair.

So a play could be so small that even though that it's there, I can't see it in the microscope. So there is no reason to exclude play because of that you can't notice it in the microscope. When you do this procedure.

Q So even though you can't see it, your testimony is even though you can't see it, it may be there?

A Of course. Zero is all -- above zero is still a play, and, you know, you can - we will have very small play, that is barely visible.

(Pervan, Tr. at 291-92) (Emphasis added).

125. Concerning the figures included in the specifications, Tony Pervan testified:

Q Let's take a look at the drawing you decided to include. You included figure 1B, right?

A 1B is there, yes.

Q And that's a joint with play?

A That is a joint with play in it, delta.

Q And we can compare that to -- do you see it up there, the play? We can compare that to the figure 4 of your mechanical lock?

A Figures 4.

Q Of the PCT – of your Swedish application?

A Four.

Q I put it next to you up on the screen. Do you see that?

A I don't follow -- that's from the --

Q This is figure--

A -- from the patent, the Swedish?

Q Right. Figure 4 of your Swedish application is up top.

A Okay.

Q And we compare that to figure 1 of your PCT application.

* * * *

Q Do you see both up there?

A Yes.

Q And they're different, correct?

A Yes.

Q In figure 4, we have no play; and in figure 1 of the PCT, we show the play?

A In the figure 1B there, there is delta which points out the play in the first Swedish, if the drawing, there is nothing that points out play.

Q Right. Let's take a look at figure 2 of your PCT application. That shows a play in the joint also, correct?

A No, that is not correct.

* * * *

Q I'm pointing out 2-C in the locked position.

A Yes.

Q And you show a gap there?

A I show a gap on the drawing. But as far as I know, this is from the patent, the PCT application. And I can't see any reference on this drawing to play. So this is a schematical drawing of a joint which could have play or not play.

Q My question to you is: There's a gap in figure 2C, correct?

A There is a gap in the picture between -- where exactly at.

Q Between the locking surface 10 and the locking 25 groove 14?

A On the picture that I can see a small, small space there.

Q Thank you. And the same is true with figure 3? Show the picture.

* * * *

Q We see the same gap, correct?

A There is -- correct, there is a space on the drawing in figure 3C.

Q Between the locking surface 10 and the locking groove 14?

A Well, on the drawing you can notice a space but still, it's not meant to be – it's not referred to anything as I know.

Q So every drawing you included in the PCT application, you have a space between the locking surface 10 and the locking groove 14?

A Well, as I remember it, at least the cross-section drawings had -- were drawn in that way so you could find a space.

(Tr. at 358-61) (Emphasis added),

126. Concerning the existence of a small gap between the locking surface of the locking element and the locking groove in the embodiments depicted in FIGs. 1 and 2, Limbert testified:

THE WITNESS: I would agree that figure 1(b) shows play associated with part of the second mechanical connection.

* * * *

Q All right. And that exists in this picture between the locking surface identified up above as 10, and the locking groove 14, correct?

A That's correct.

Q Now, let's go to figure 2(c). And I believe your testimony was that this was not a production drawing, correct?

A I may have said something like that, yes.

Q But you will agree with me that there's a gap here between the locking groove 14 and the locking surface 10?

A Yes, I would agree in this patent drawing, that there's a separation between the left vertical surface groove 14, and the surface 10 of the element 8.

Tr. at 933-34) (Emphasis added).

{

}

128. Although Limbert acknowledged previously that there was a gap in between the locking surface of the locking

element and the locking groove, he refused to acknowledge this as play, testifying as follows:

Q And I'd like to compare figure 2(c) of the '410 patent to the lower figure in RX-1467. Do you see that.

A Okay.

Q Now, there's some similar layers, correct?

A Yes, there are.

Q They both show a play in the joint, correct?

A Well, again, the one on the right calls it out, there is nothing on the drawing on the – there's nothing in figure 2(c), the patent drawing in figure 2(c), that calls out that clearance.

* * * *

THE WITNESS: I don't here. And I don't see it in clainl 2 or claim 3 or in any of the claims of the '907 patent. But I do see, you know, this idea of play in a few locations in the specification.

JUDGE LUCKERN: Yeah. Well, I know, I pointed those out, those places.

THE WITNESS: And I think there may be one or two more. Those generally, to me, refer to specific embodiments of the inventions.

JUDGE LUCKERN: Would you agree that the figures of figures one, two and three, all show play, would you – maybe not, I don't know. I'm only saying based on what you've heard some people argue. But – but as an expert, and you've been qualified as an expert, would the figures, and I'm looking now at figure l(b), we have this little delta sign, and I'm also looking at figure 2, I think we've got something there, someplace that has a – or maybe in the specification. And I think something in the specification. Would you agree that that play this play that we referenced in the specification, is shown in, say, figure l(b)?

THE WITNESS: Yes, it is illustrated and called out in figure l(b).

JUDGE LUCKERN: How about figure 2, is it - is there any play shown engineering in figure 2, in your opinion

THE WITNESS: Well, I would say that there is no play called out in that drawing like it is in figure –

JUDGE LUCKERN: Yeah, I don't see the delta sign there. And –

THE WITNESS: Well, that's right and that's my point, it is not called out.

JUDGE LUCKERN: Is it there by a number?

THE WITNESS: No, I don't – I don't – I don't think so. I mean, I'm interpreting these not as engineering drawings but as patent drawings. And so if it's not pointing it out to me, then I'm not sure that it's there.

With regard to – I think you are asking something about play and how it relates to claim 1 of this patent. Was I – was I –

* * *

JUDGE LUCKERN: And why doesn't [play] have to be there, in order to make the method of claim 1 work? And I'm not trying to be argumentative, if I am argumentative let's move on, I'll certainly understand it.

THE WITNESS: Well, let me finish with why, with my opinion regarding play in claim 1 of the '907 patent. I mentioned previously that it's not called out in the claim. The secondly, that when play normally shows up in the specification, it's preceded by a can, not a must or does. I've also – you pointed out that only figure 1b of all of the figures that are included in the patent call out the play delta: it's not called out in any of the other drawings.

(Tr. at 933, 966-67, 969) (Emphasis added)

CONCLUSIONS OF LAW

1. The Commission has in rem jurisdiction, subject matter jurisdiction and in personam jurisdiction.

2. There has been an importation of certain flooring products which are the subject of the alleged unfair trade allegation.

3. 35 U.S.C. § 112, ¶ 6 applies to the asserted claims of each of the '267, '907 and '410 patents and the 35 U.S.C. § 112, ¶ 6 structure requires "play."

4. Each asserted claim of each of the '267, '907 and '410 patents requires the limitation of "play."

5. No domestic industry exists, as required by subsection (a) (2) of section 337, that exploits each of the '267, '907 and '410 patents.

6. Respondents have failed to establish that the asserted claims of each of the '267, '907 and '410 patents are not valid.

7. Complainants have not established that the asserted claims of the '267, '907 and '410 patents are infringed by any of the respondents.

8. It has not been established that complainants misused the patents in issue.

9. Respondents are not in violalion of section 337 based on any importation into the United States, sale for importation, and sale within the United States after

importation of certain flooring products which are the subject of the alleged unfair trade allegations.

ORDER

Based on the foregoing opinion, it is the administrative law judge's final initial determination that there has been no violation of section 337 in the importation into the United States, sale for importation, and the sale within the United States after importation of certain flooring products by any of the respondents.

The administrative law judge hereby CERTIFIES to the Commission his final initial determination together with the record consisting of the exhibits admitted into evidence. The pleadings of the parties filed with the Secretary and the transcript of the hearing, including closing arguments, are not certified, since they are already in the Commission's possession in accordance with Commission rules.

Further it is ORDERED that:

1. In accordance with Commission rule 210.39, all material heretofore marked in camera because of business, financial, and marketing data found by the administrative law judge to be cognizable as confidential business information under Commission rule 201.6(a) is to be given in camera treatment continuing after the date this investigation is terminated.

2. Counsel for the parties shall have in the hands of the administrative law judge those portions of the final initial determination which contain bracketed confidential business information to be deleted from any public version of said determination, no later than November 20, 2001. Any such

bracketed version shall not be served by telecopy on the administrative law judge. If no such bracketed version is received from a party it will mean that the party has no objection to removing the confidential status, in its entirety, from this initial determination.

3. This final initial determination, issued pursuant to Commission rule 210.42(h)(2), shall become the determination of the Commission forty-five (45) days after the service thereof, unless the Commission, within that period shall have ordered its review in its entirety or certain issues therein, or by order has changed the effective date of said initial determination.

Paul J. Luckern
Administrative Law Judge

Issued: November 2, 2001

CERTAIN FLOORING PRODUCTS
Investigation No. 337-TA-443

CERTIFICATE OF SERVICE

I, Donna R. Koehnke, hereby certify that the attached **Public Version Initial Determination** was served by hand upon James B. Coughlan, Esq., and upon the following parties via first class mail, and air mail where necessary, on December 11, 2001

/s/_____
Donna R. Koehnke, Secretary
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CERTAIN FLOORING PRODUCTS
Investigation No. 337-TA-443

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CERTAIN FLOORING PRODUCTS
Investigation No. 337-TA-443

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OFFICE OF THE SECRETARY

UNITED STATES INTERNATIONAL
TRADE COMMISSION

WASHINGTON, D.C. 20436

December 11, 2001

Joanne Stump, Chief
Intellectual Property Rights Branch
United States Customs Service
Ronald Reagan Building, 3rd Floor
1300 Pennsylvania Avenue, NW
Washington, DC 20229

Dear Ms. Stump:

A Commission administrative law judge has issued in recommended determination (ID) in Inv. No. 337-TA-443, Certain Flooring Products.

A copy of the ID will be provided to you upon request, and written comments may be filed thereon. If you would like to have a copy of the ID, please contact Marilyn R. Abbott, Deputy Secretary, at (202) 205-1802.

If you have questions about the investigation, please telephone the Commission advisory attorney at Michael Diehl, Esq., at (202) 205-3095.

Sincerely,
/s/_____
Donna R. Koehnke
Secretary

OFFICE OF THE SECRETARY

UNITED STATES INTERNATIONAL
TRADE COMMISSION

WASHINGTON, D.C. 20436

December 11, 2001

Charles S. Stark, Esq.
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Antitrust Division
Pennsylvania Avenue & 10th Street, NW
Washington, DC 20530

Dear Mr. Stark:

A Commission administrative law judge has issued in recommended determination (ID) in Inv. No. 337-TA-443, Certain Flooring Products.

A copy of the ID will be provided to you upon request, and written comments may be filed thereon. If you would like to have a copy of the ID, please contact Marilyn R. Abbott, Deputy Secretary, at (202) 205-1802.

If you have questions about the investigation, please telephone the Commission advisory attorney at Michael Diehl, Esq., at (202) 205-3095.

Sincerely,

/s/_____
Donna R. Koehnke
Secretary

OFFICE OF THE SECRETARY

UNITED STATES INTERNATIONAL
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WASHINGTON, D.C. 20436

December 11, 2001

Richard Lambert, Esq.
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Dear Mr. Lambert:

A Commission administrative law judge has issued in recommended determination (ID) in Inv. No. 337-TA-443, Certain Flooring Products.

A copy of the ID will be provided to you upon request, and written comments may be filed thereon. If you would like to have a copy of the ID, please contact Marilyn R. Abbott, Deputy Secretary, at (202) 205-1802.

If you have questions about the investigation, please telephone the Commission advisory attorney at Michael Diehl, Esq., at (202) 205-3095.

Sincerely,

/s/_____

Donna R. Koehnke
Secretary

OFFICE OF THE SECRETARY

UNITED STATES INTERNATIONAL
TRADE COMMISSION

WASHINGTON, D.C. 20436

December 11, 2001

Randy Tritell, Esq.
Director of International Antitrust
Federal Trade Commission
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Dear Mr. Tritell:

A Commission administrative law judge has issued in recommended determination (ID) in Inv. No. 337-TA-443, Certain Flooring Products.

A copy of the ID will be provided to you upon request, and written comments may be filed thereon. If you would like to have a copy of the ID, please contact Marilyn R. Abbott, Deputy Secretary, at (202) 205-1802.

If you have questions about the investigation, please telephone the Commission advisory attorney at Michael Diehl, Esq., at (202) 205-3095.

Sincerely,
/s/_____
Donna R. Koehnke
Secretary

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No. _____

In the Supreme Court of the United States

ALLOC, INC., BERRY FINANCE N.V.,
and VÄLINGE INNOVATIONS AB,
fka VÄLINGE ALUMINIUM, AB,
Petitioners,

v.

INTERNATIONAL TRADE COMMISSION, and
PERGO, INC., and ROYSOL, and
AKZENTA PANEELE + PROFILE GmbH,
and UNILIN DÉCOR N.V., BHK OF AMERICA,
and MEISTER-LEISTEN SCHULTE, GmbH,
Respondents.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

APPENDICES E-L to PETITION FOR WRIT OF CERTIORARI

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Appendix 1a

Volume 1

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APPENDIX E

UNITED STATES PATENT

Patent No. 6,023,907

See Fold Out Exhibit
Diagrams

US006023907A

United States Patent [19]

Pervan

[11] Patent Number: 6,023,907

[45] Date of Patent: *Feb. 15, 2000

[54] **METHOD FOR JOINING BUILDING BOARDS**

[75] Inventor: **Tony Pervan**, Solna, Sweden

[73] Assignee: **Välinge Aluminium AB**, Viken, Sweden

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **09/193,687**

[22] Filed: **Nov. 18, 1998**

Related U.S. Application Data

[60] Continuation of application No. 09/003,499, Jan. 6, 1998, Pat. No. 5,860,267, which is a division of application No. 08/436,224, May 17, 1995, Pat. No. 5,706,621, and a continuation of application No. PCT/SE94/00386, Apr. 29, 1994.

[30] **Foreign Application Priority Data**

May 10, 1993 [SE] Sweden 9301595

[51] **Int. Cl.**[7] **E04B 1/12**

[52] **U.S. Cl.** **52/748.1**; 52/747.1; 52/747.11; 52/403.1; 52/480; 52/506.05; 52/551; 52/582.1; 52/592.2

[58] **Field of Search** 52/480, 550, 551, 52/506.05, 403.1, 745.05, 745.21, 747.1, 747.11, 748.1, 582.1, 591.3, 592.2

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Primary Examiner—Carl D. Friedman
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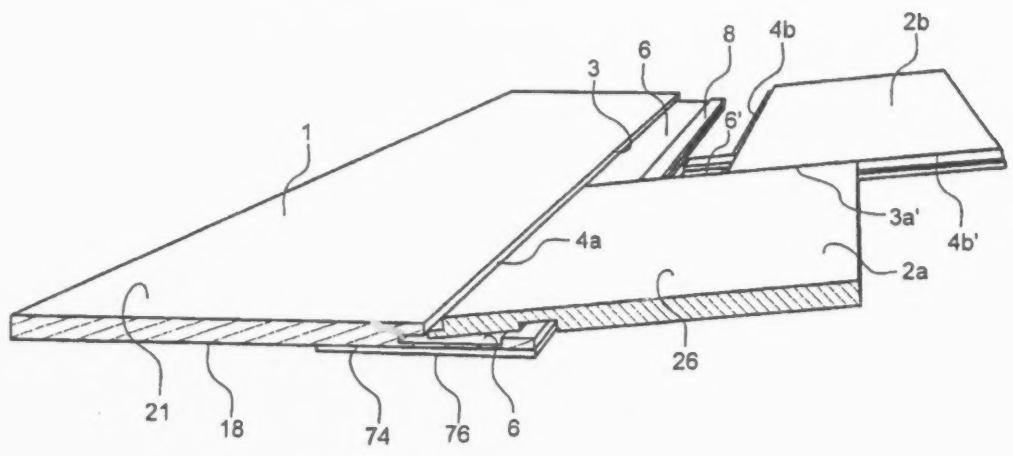
[57] **ABSTRACT**

The invention relates to a system for laying and mechanically joining building panels, especially thin, hard, floating floors. Adjacent joint edges **(3, 4)** of two panels **(1, 2)** engage each other to provide a first mechanical connection locking the joint edges **(3, 4)** in a first direction **(D1)** perpendicular to the principal plane of the panels. In each joint, there is further provided a strip **(6)** which is integrated with one joint edge **(3)** and which projects behind the other joint edge **(4)**. The strip **(6)** has an upwardly protruding locking element **(8)** engaging in a locking groove **(14)** in the rear side **(16)** of the other joint edge **(4)** to form a second mechanical connection locking the panels **(1, 2)** in a second direction **(D2)** parallel to the principal plane of the panels and at right angles to the joint. Both the first and the second mechanical connection allow mutual displacement of joined panels **(1, 2)** in the direction of the joint.

14 Claims, 6 Drawing Sheets



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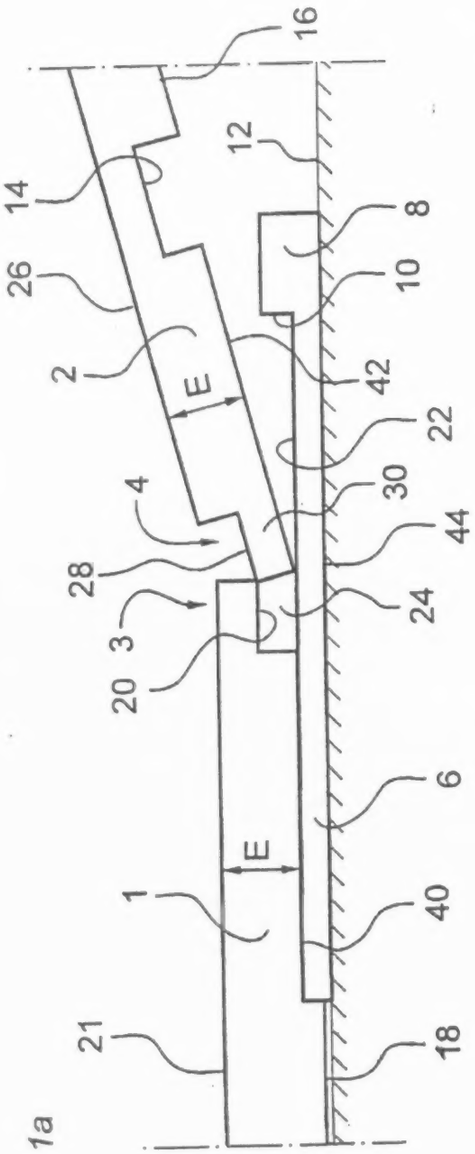
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Fig. 1a

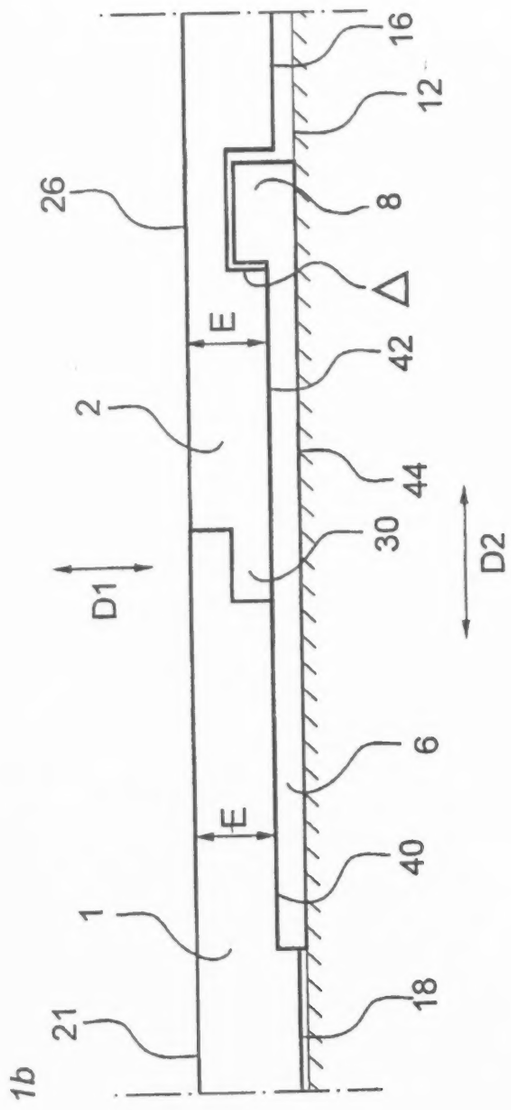
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Fig. 1b

Fig. 2a

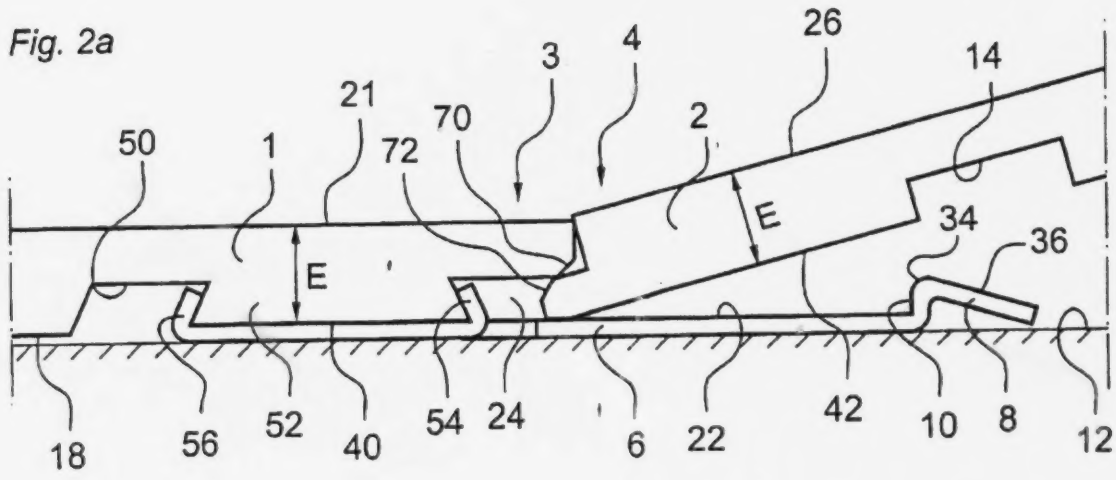


Fig. 2b

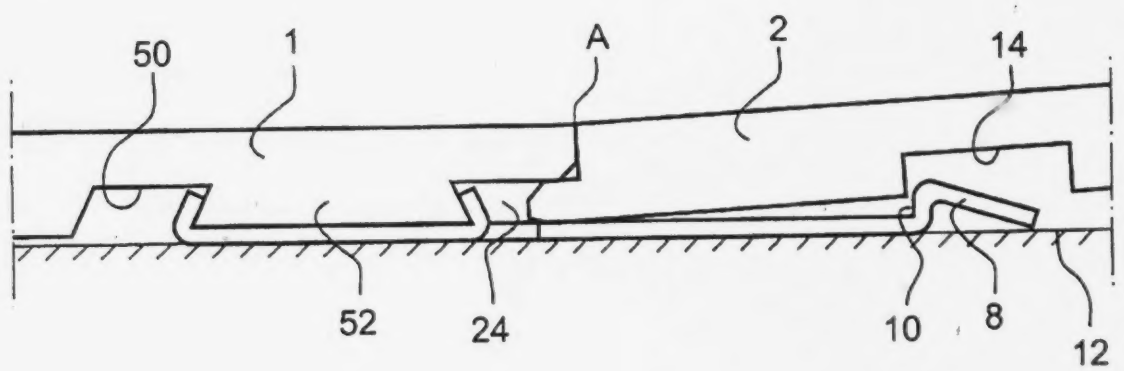


Fig. 2c

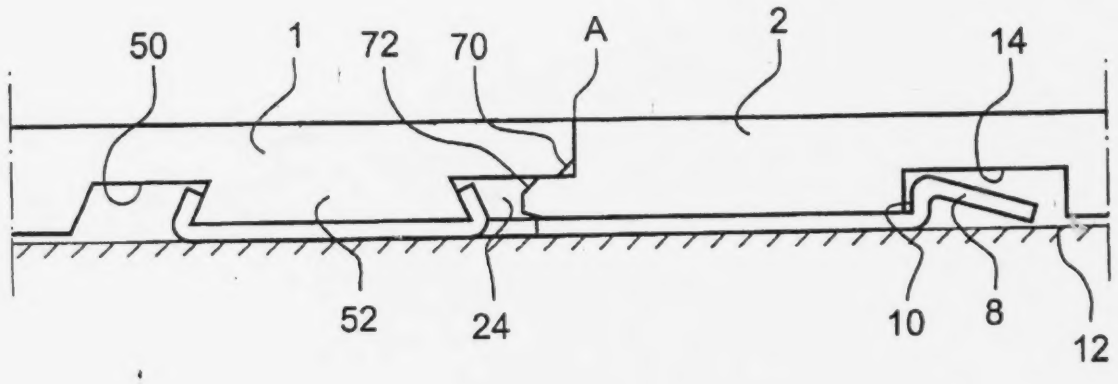


Fig. 3a

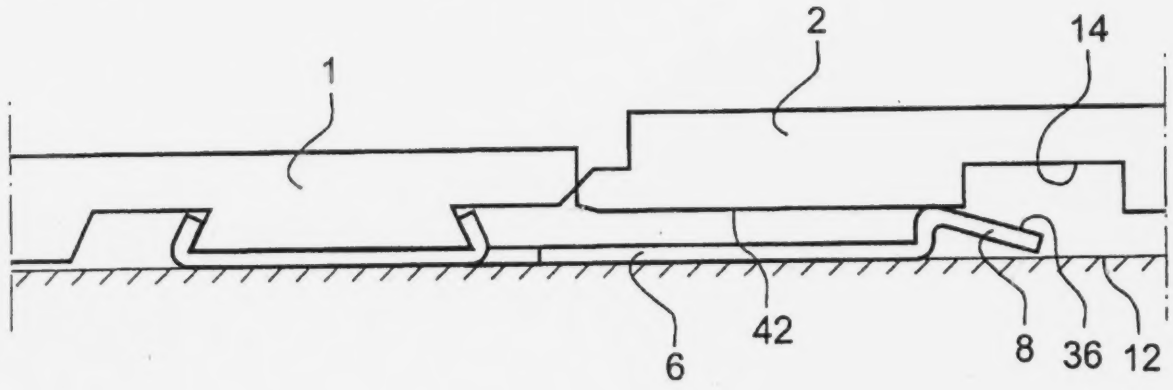


Fig. 3b

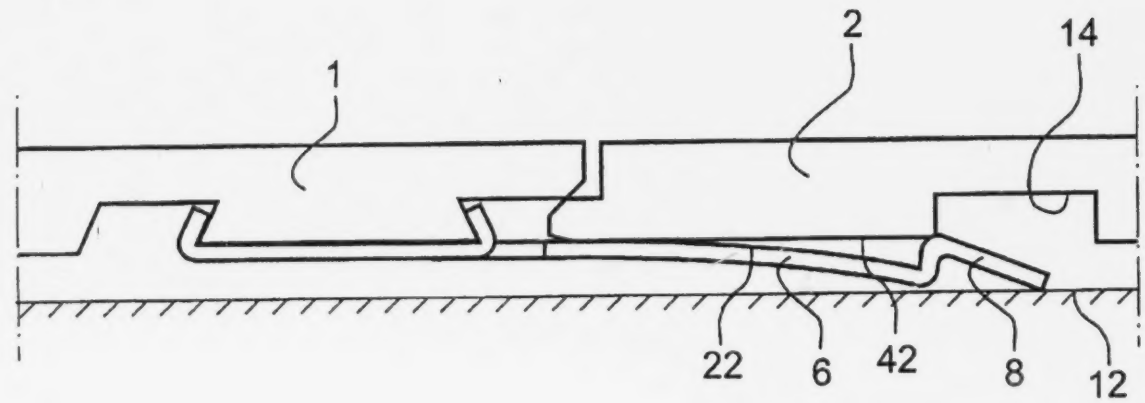


Fig. 3c

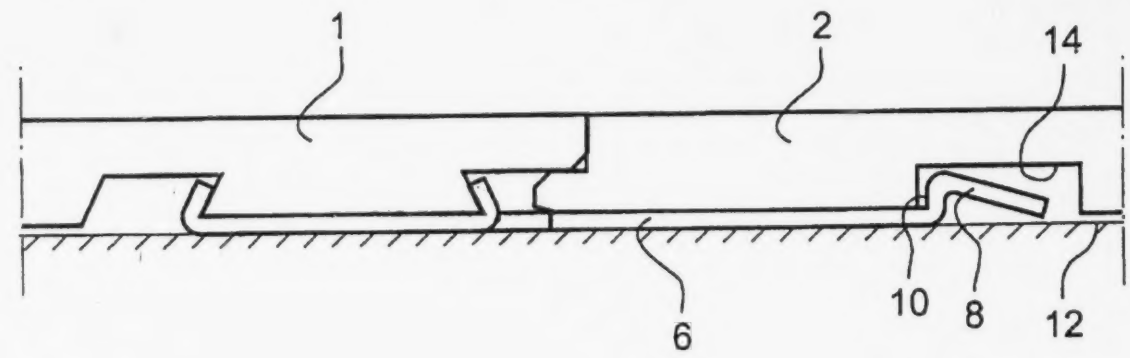


Fig. 4a

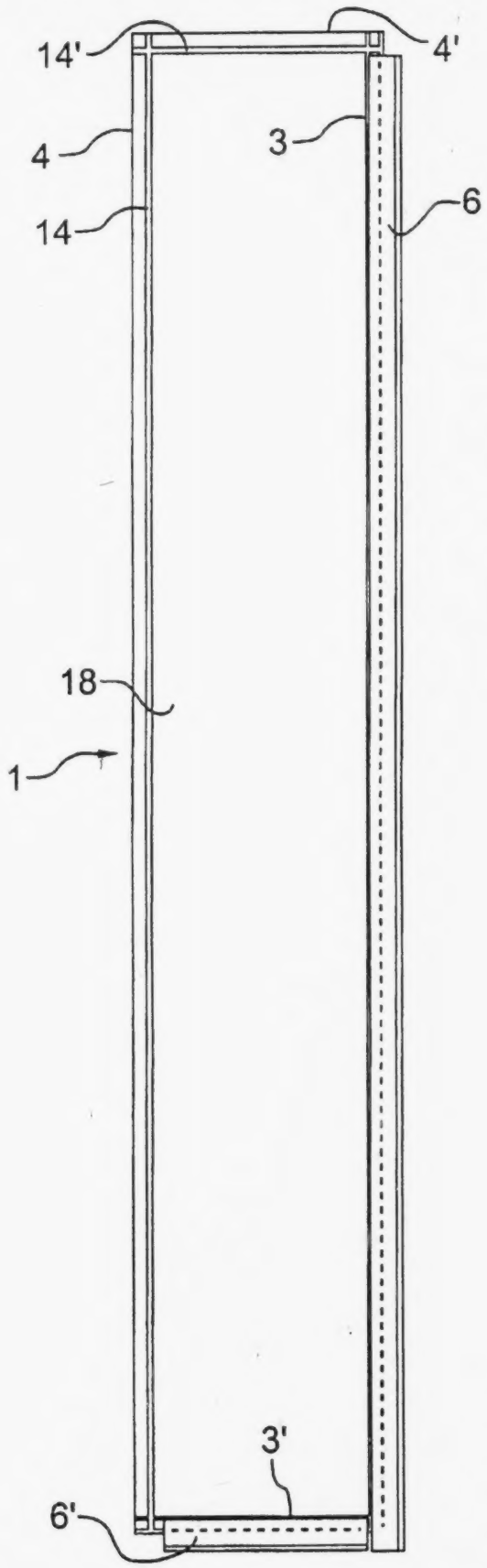
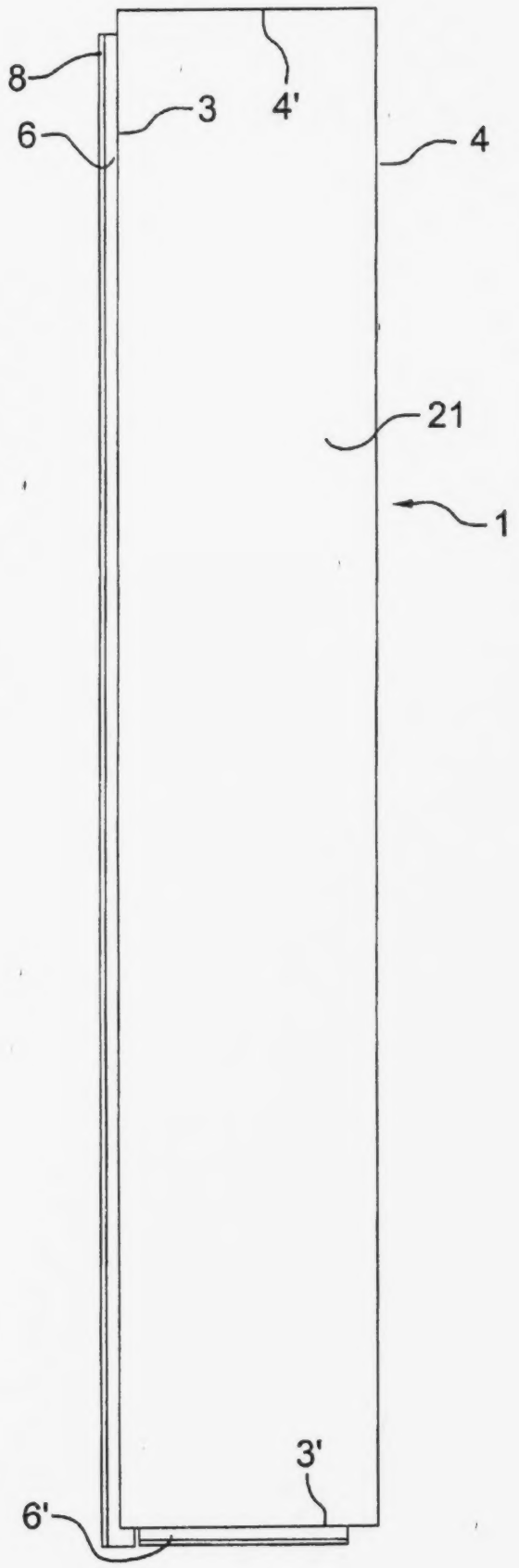


Fig. 4b



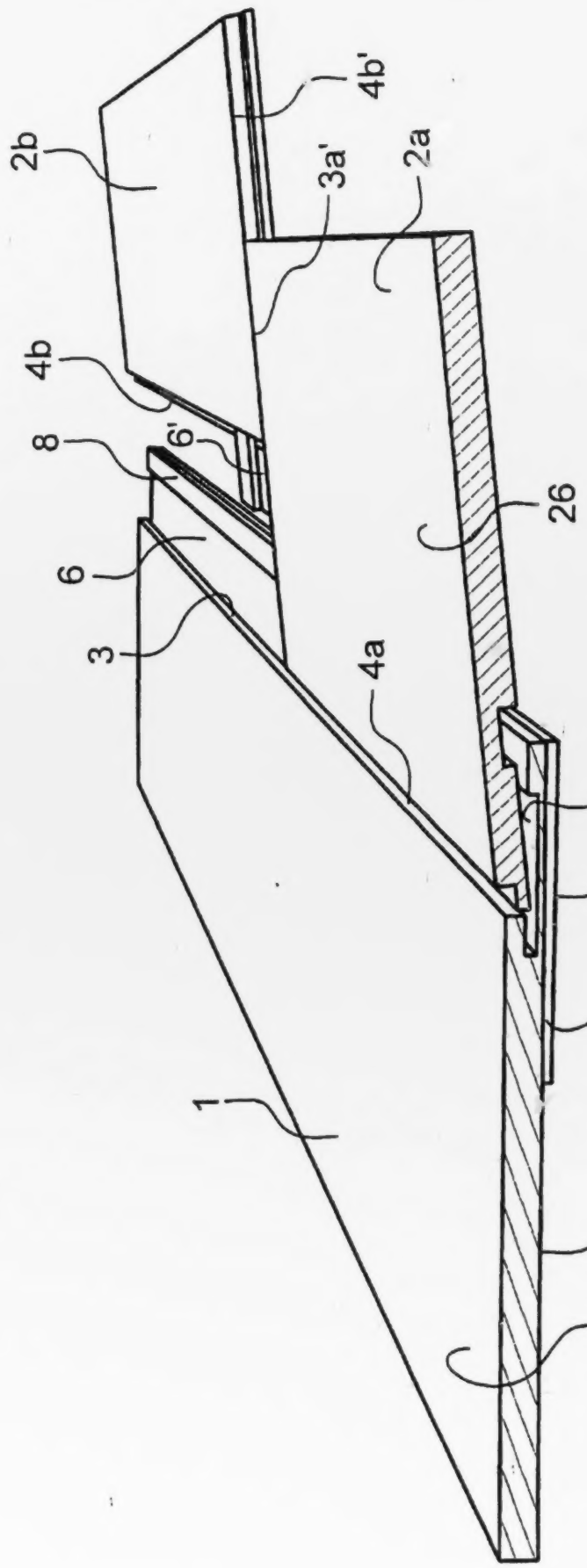


Fig. 5

Fig. 6

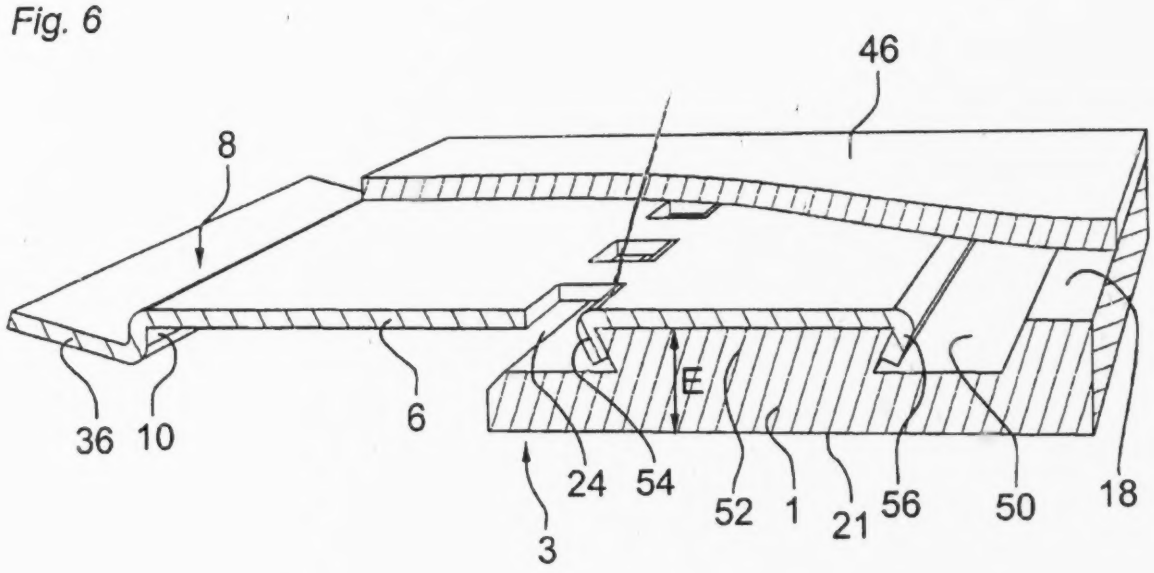
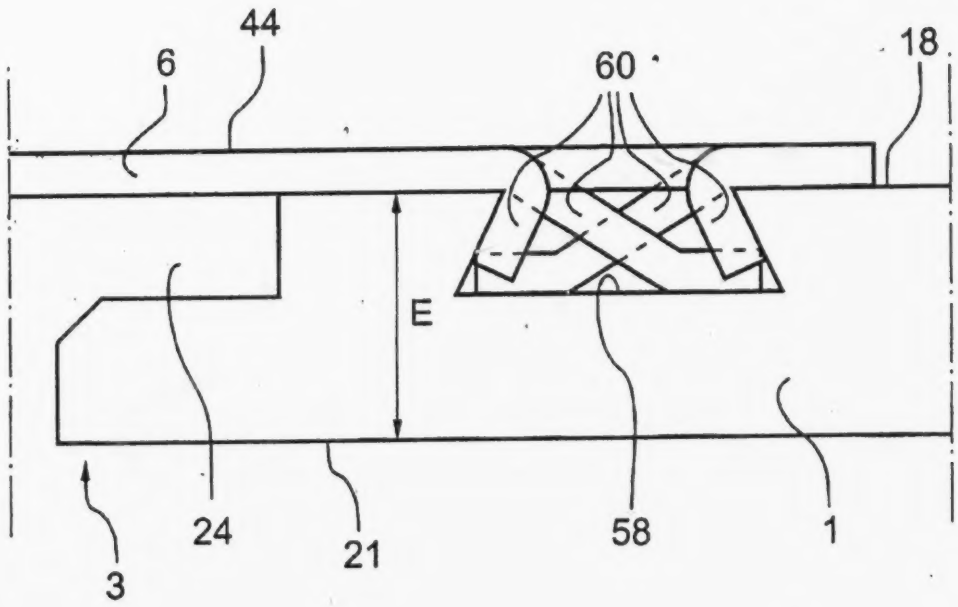


Fig. 7



6,023,907

[1]

METHOD FOR JOINING BUILDING BOARDS

This application is a continuation of application Ser. No. 09/003,499, filed Jan. 6, 1998, now U.S. Pat. No. 5,860,267, [5] which is a divisional of application Ser. No. 08/436,224 filed on May 17, 1995, now U.S. Pat. No. 5,706,621 and a continuation of PCT/SE94/00386 filed on Apr. 29, 1994.

TECHNICAL FIELD [10]

The invention generally relates to a system for providing a joint along adjacent joint edges of two building panels, especially floor panels.

More specifically, the joint is of the type where the adjacent joint edges together form a first mechanical connection [15] locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, and where a locking device forms a second mechanical connection locking the panels to each other in a second direction parallel to the principal plane and at right angles [20] to the joint edges. The locking device comprising a locking groove which extends parallel to and spaced from the joint edge of one of the panels, and said locking groove being open at the rear side of this one panel.

The invention is especially well suited for use in joining [25] floor panels, especially thin laminated floors. Thus, the following description of the prior art and of the objects and features of the invention will be focused on this field of use. It should however be emphasized that the invention is useful

also for joining ordinary wooden floors as well as other types [30] of building panels, such as wall panels and roof slabs.

BACKGROUND OF THE INVENTION

A joint of the aforementioned type is known e.g. from SE [35] 450,141. The first mechanical connection is achieved by means of joint edges having tongues and grooves. The locking device for the second mechanical connection comprises two oblique locking grooves, one in the rear side of each panel, and a plurality of spaced-apart spring clips [40] which are distributed along the joint and the legs of which are pressed into the grooves, and which are biased so as to tightly clamp the floor panels together. Such a joining technique is especially useful for joining thick floor panels to form surfaces of a considerable expanse. [45]

Thin floor panels of a thickness of about 7-10 mm, especially laminated floors, have in a short time taken a substantial share of the market. All thin floor panels employed are laid as "floating floors" without being attached to the supporting structure. As a rule, the dimension of the [50] floor panels is 200x1200 mm, and their long and short sides are formed with tongues and grooves. Traditionally, the floor is assembled by applying glue in the groove and forming the floor panels together. The tongue is then glued in the groove of the other panel. As a role, a laminated floor consists of an [55] upper decorative wear layer of laminate having a thickness of about 1 mm, an intermediate core of particle board or other board, and a base layer to balance the construction. The core has essentially poorer properties than the laminate, e.g. in respect of hardness and water resistance, bit it is [60] nonetheless needed primarily for providing a groove and tongue for assemblage. This means that the overall thickness must be at least about 7 mm. These known

laminated floors using glued tongue-and-groove joints however suffer from several inconveniences. [65]

First, the requirement of an overall thickness of at least about 7 mm entails an undesirable restraint in connection

[2]

with the laying of the floor, since it is easier to cope with low thresholds when using thin floor panels, and doors must often be adjusted in height to come clear of the floor laid. Moreover, manufacturing costs are directly linked with the consumption of material. [5]

Second, the core must be made of moisture-absorbent material to permit using water-based glues when laying the floor. Therefore, it is not possible to make the floors thinner using so-called compact laminate, because of the absence of suitable gluing methods for such non-moisture-absorbent [10] core materials.

Third, since the laminate layer of the laminated floors is highly wear-resistant, tool wear is a major problem when working the surface in connection with the formation of the tongue. [15]

Fourth, the strength of the joint, based on a glued tongue-and-groove connection, is restricted by the properties of the core and of the glue as well as by the depth and height of the groove. The laying quality is entirely dependent on the gluing. In the event of poor gluing, the joint will open as a [20] result of the tensile stresses which occur e.g. in connection with a change in air humidity.

Fifth, laying a floor with glued tongue-and-groove joints is time-consuming, in that glue must be applied to every panel on both the long and short sides thereof. [25]

Sixth, it is not possible to disassemble a glued floor once laid, without having to break up the joints. Floor panels that have been taken up cannot therefore be used again. This is a

drawback particularly in rental houses where the flat concerned must be put back into the initial state of occupancy. [30] Nor can damaged or worn-out panels be replaced without extensive efforts, which would be particularly desirable on public premises and other areas where parts of the floor are subjected to great wear.

Seventh, known laminated floors are not suited for such [35] use as involves a considerable risk of moisture penetrating down into the moisture-sensitive core.

Eighth, present-day hard, floating floors require, prior to laying the floor panels on hard subfloors, the laying of a separate underlay of floor board, felt, foam or the like, which [40] is to damp impact sounds and to make the floor more pleasant to walk on. The placement of the underlay is a complicated operation, since the underlay must be placed in edge-to-edge fashion. Different underlays affect the properties of the floor. [45]

There is thus a strongly-felt need to overcome the above-mentioned drawbacks of the prior art. It is however not possible simply to use the known joining technique with glued tongues and grooves for very thin floors, e.g. with floor thicknesses of about 3 mm, since a joint based on a [50] tongue-and-groove connection would not be sufficiently strong and practically impossible to produce for such thin floors. Nor are any other known joining techniques usable for such thin floors. Another reason why the making of thin floors from e.g. compact laminate involves problems is the [55] thickness tolerances of the panels, being about 0.2-0.3 mm for a panel thickness of about 3 mm. A 3-mm compact laminate panel having such a thickness tolerance would have, in ground to uniform thickness on its rear side, an unsymmetrical design, entailing the risk of bulging. [60] Moreover, if the panels have different thicknesses, this also means that the joint will be subjected to excessive load.

Nor is it possible to overcome the above-mentioned problems by using double-adhesive tape or the like on the undersides of the panels, since such a connection catches [65] directly and does not allow for subsequent adjustment of the panels as is the case with ordinary gluing.

[3]

Using U-shaped clips of the type disclosed in the above-mentioned SE 450.141, or similar techniques to overcome the drawbacks discussed above is no viable alternative either. Especially, biased clips of this type cannot be used for joining panels of such a small thickness as 3 mm. Normally, [5] it is not possible to disassemble the floor panels without having access to their undersides. This known technology relying on clips suffers from the additional drawbacks:

Subsequent adjustment of the panels in their longitudinal direction is a complicated operation in connection with [10] laying, since the clips urge the panels tightly against each other. Floor laying using clips is time-consuming.

This technique is usable only in those cases where the floor panels are resting on underlying joists with the [15] clips placed there between. For thin floors to be laid on a continuous, flat supporting structure, such clips cannot be used.

The floor panels can be joined together only at their long sides. No clip connection is provided on the short sides. [20]

TECHNICAL PROBLEMS AND OBJECTS OF THE INVENTION

A main object of the invention therefore is to provide a system for joining together building panels, especially floor

[25] panels for hard, floating floors, which allows using floor panels of a smaller overall thickness than present-day floor panels.

A particular object of the invention is to provide a panel-joining system which [30]

makes it possible in a simple, cheap and rational way to provide a joint between floor panels without requiring the use of glue, especially a joint based primarily only on mechanical connections between the panels; [35]

can be used for joining floor panels which have a smaller thickness than present-day laminated floors and which have, because of the use of a different core material, superior properties than present-day floors even at a thickness of 3 mm; [40]

makes it possible between thin floor panels to provide a joint that eliminates any unevennesses in the joint because of thickness tolerances of the panels;

allows joining all the edges of the panels;

reduces tool wear when manufacturing floor panels with [45] hard surface layers;

allows repeated disassembly and reassembly of a floor previously laid, without causing damage to the panels, while ensuring high laying quality;

makes it possible to provide moisture-proof floors; [50]

makes it possible to obviate the need of accurate, separate placement of an underlay before laying the floor panels; and

considerably cuts the time for joining the panels.

These and other objects of the invention are achieved by [55] means of a panel-joining system having the features recited in the appended claims.

Thus, the invention provides a system for making a joint along adjacent joint edges of two building panels, especially floor panels, in which joint: [60]

the adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, and

a locking device arranged on the rear side of the panels [65] forms a second mechanical connection locking the panels to

each other in a second direction parallel to the principal plane and at right angles to the joint edges, said locking device comprising a locking groove which extends parallel to and spaced from the joint edge of one of said panels, termed groove panel, and which is open at the rear side of [5] the groove panel, said system being characterized in.

that the locking device further comprises a strip integrated with the other of said panels, termed strip panel, said strip extending throughout substantially the entire length of the joint edge of the strip panel and being provided with a [10] locking element projecting from the strip, such that when the panels are joined together, the strip projects on the rear side of the groove panel with its locking element received in the locking groove of the groove panel, that the panels, when joined together, can occupy a [15] relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection,

that the first and the second mechanical connection both [20] allow mutual displacement of the panels in the direction of the joint edges, and

that the second mechanical connection is so conceived as to allow the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly [25] away from the strip.

The term "rear side" as used above be considered to comprise any side of the panel located behind underneath the front side of the panel. The opening plane of the locking groove of the groove panel can thus be located at a distance [30] from the rear surface of the panel resting on the supporting structure. Moreover, the strip, which in the invention extends throughout substantially the entire length of the joint edge of the strip panel should be considered to encompass both the case where the strip is continuous, uninterrupted [35] element, and the case where the "strip" consists in its longitudinal direction of several parts, together covering the main portion of the joint edge.

It should also be noted (i) that it is the first and the second mechanical connection as such that permit mutual displacement [40] of the panels in the direction of the joint edges, and that (ii) it is the second mechanical connection as such that permits the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip. Within the scope of the invention, there [45] may thus exist means, such as glue and mechanical devices, that can counteract or prevent such displacement and/or upward angling.

The system according to the invention makes it possible to provide concealed, precise locking of both the short and [50] long sides of the panels in hard, thin floors. The floor panels can be quickly and conveniently disassembled in the reverse order of laying without any risk of damage to the panels, ensuring at the same time a high laying quality. The panels can be assembled and disassembled much faster than in [55] present-day systems, and any damaged or worn-out panels can be replaced by taking up and re-laying parts of the floor.

According to an especially preferred embodiment of the invention, a system is provided which permits precise joining of thin floor panels having, for example, a thickness of [60] the order of 3 mm and which at the same time provides a tolerance-independent smooth top face at the joint. To this end, the strip is mounted in an equalizing groove which is countersunk in the rear side of the strip panel and which exhibits an exact, predetermined distance from its bottom to [65] the front side of the strip panel. The part of the strip projecting behind the groove panel engages a corresponding

[5]

equalizing groove, which is countersunk in the rear side of the groove panel and which exhibits the same exact, predetermined distance from its bottom to the front side of the groove panel. The thickness of the strip then is at least so great that the rear side of the strip is flush with, and [5] preferably projects slightly below the rear side of the panels. In this embodiment, the panels will always rest, in the joint, with their equalizing grooves on a strip. This levels out the tolerance and imparts the necessary strength to the joint. The strip transmits horizontal and upwardly-directed forces to [6] the panels and downwardly-directed forces to the existing subfloor.

Preferably, the strip may consist of a material which is flexible, resilient and strong, and can be sawn. A preferred strip material is sheet aluminium. In an aluminium strip, [15] sufficient strength can be achieved with a strip thickness of the order of 0.5 mm.

In order to permit taking up previously laid, joined floor panels in a simple way, a preferred embodiment of the invention is characterized in that when the groove panel is [20] pressed against the strip panel in the second direction and is turned anglularly away from the strip, the maximum

distance between the axis of rotation of the groove panel and the locking surface of the locking groove closest to the joint edges is such that the locking element can leave the locking [25] groove without contacting the locking surface of the locking groove. Such a disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm.

According to the invention, the locking surface of the [30] locking element is able to provide a sufficient locking function even with very small heights of the locking surface. Efficient locking of 3-mm floor panels can be achieved with a locking surface that is as low as 2 mm. Even if a 0.5-mm-high locking surface may provide sufficient locking. [35] The term "locking surface" as used herein relates to the part of the locking element engaging the locking groove to form the second mechanical connection.

For optimal function of the invention, the strip and the locking element should be formed on the strip panel with [40] high precision. Especially, the locking surface of the locking element should be located at an exact distance from the joint edge of the strip panel.

Furthermore, the extent of the engagement in the floor panels should be minimised, since it reduces the floor [45] strength.

By known manufacturing methods, it is possible to produce a strip with a locking pin, for example by extruding aluminium or plastics into a suitable section, which is thereafter glued to the floor panel or is inserted in special [50] grooves. These and all other traditional methods do however not ensure optimum function and an optimum level of economy. To product the joint system according to the invention, the strip is suitably formed from sheet aluminium, and is mechanically fixed to the strip panel. [55]

The laying of the panels can be performed by first placing the strip panel on the subfloor and then moving the groove

panel with its long side up to the long side of the strip panel, at an angle between the principal plane of the groove panel and the subfloor. When the joint edges have been brought [60] into engagement with each other to form the first mechanical connection, the groove panel is angled down so as to accommodate the locking element in the locking groove.

Laying can also be performed by first placing both the strip panel and the groove panel flat on the subfloor and then [65] joining the panels parallel to their principal planes while bending the strip downwards until the locking element snaps

[6]

up into the locking groove. This laying technique enables in particular mechanical locking of both the short and long sides of the floor panels. For example, the long sides can be joined together by using the first laying technique with downward angling of the groove panel, while the short sides [5] are subsequently joined together by displacing the groove panel in its longitudinal direction until its short side is pressed on and locked to the short side of an adjacent panel in the same row.

In connection with their manufacture, the floor panels [10] can be provided with an underlay of e.g. floor board, foam or felt. The underlay should preferably cover the strip such that the joint between the underlays is offset in relation to the joint between the floor panels.

The above and other features and advantages of the [15] invention will appear from the appended claims and the following description of embodiments of the invention.

The invention will now be described in more detail hereinbelow with reference to the accompanying drawing Figure. [20]

DESCRIPTION OF DRAWING FIGURES

FIGS. **1***a* and **1***b* schematically show in two stages how two floor panels of different thickness are joined together in floating fashion according to a first embodiment of the [25] invention.

FIGS. **2***a-c* show in three stages a method for mechanically joining two floor panels according to a second embodiment of the invention.

FIGS. **3***a-c* show in three stages another method for [30] mechanically joining the floor panels of FIGS. **2***a-c*.

FIGS. **4***a* and **4***b* show a floor panel according to FIGS. **2***a-c* as seen from below and from above, respectively.

FIG. **5** illustrates in perspective a method for laying and [35] joining floor panels according to a third embodiment of the invention.

FIG. **6** shows in perspective and from below a first variant for mounting a strip on a floor panel.

FIG. **7** shows in section a second variant for mounting a [40] strip on a floor panel.

DESCRIPTION OF PREFERRED EMBODIMENTS

FIGS. **1***a* and **1***b*, to which reference is now made, [45] illustrate a first floor panel **1**, hereinafter termed strip panel, and a second floor panel **2**, hereinafter termed groove panel. The terms "strip panel" and "groove panel" are merely intended to facilitate the description of the invention, the panels **1**, **2** normally being identical in practice. The panels [50] **1** and **2** may be made from compact laminate and may have a thickness of about 3 mm with a thickness tolerance of about ± 0.2 mm. Considering this thickness tolerance, the panels **1** and **2** are illustrated with different thicknesses (FIG. **1***b*), the strip panel 1 having a maximum thickness (3.2 mm)

[55] and the groove panel **2** having a minimum thickness (2.8 mm).

To enable mechanical joining of the panels **1**, **2** at opposing joint edges, generally designated **3** and **4**, respectively, the panels are provided with grooves and strips [60] as described in the following.

Reference is now made primarily to FIGS. **1***a* and **1***b*, and secondly to FIGS. **4***a* and **4***b* showing the basic design of the floor panels from below and from above, respectively. [65]

From the joint edge **3** of the strip panel **1**, i.e. the one long side, projects horizontally a fiat strip **6** mounted at the

[7]

factory on the underside of the strip panel **1** and extending throughout the entire joint edge **3**. The strip **6**, which is made of flexible, resilient sheet aluminium, can be fixed mechanically, by means of glue or in any other suitable way. In FIGS. **1***a* and **1***b*, the strip **6** is glued, while in FIGS. **4***a* [5] and **4***b* it is mounted by means of a mechanical connection, which will be described in more detail hereinbelow.

Other strip materials can be used, such as sheets of other metals, as well as aluminium or plastics sections. Alternatively, the strip **6** may be integrally formed with the [10] strip panel **1**. At any rate, the strip **6** should be integrated with the strip panel **1**, i.e. it should not be mounted on the strip panel **1** in connection with laying. As a non-restrictive example, the strip **5** may have a width of about 30 mm and a thickness of about 0.5 mm. [15]

As appears from FIGS. **4***a* and **4***b*, a similar, although shorter strip **6'** is provided also at one short side **3'** of the strip
panel **1**. The shorter strip **6'** does however not extend throughout the entire short side **3'** but is otherwise identical

with the strip **6** and, therefore, is not described in more detail [20] here.

The edge of the strip 6 facing away from the joint edge **3** is formed with a locking element **8** extended throughout the entire strip **6**. The locking element **8** has a locking surface **10** facing the joint edge **3** and having a height of e.g. 0.5 mm. [25] The locking element **8** is so designed that when the floor is being laid and the strip panel **2** of FIG. **1***a* is pressed with its joint edge **4** against the joint edge **3** of the strip panel **1** and is angled down against the subfloor **12** according to FIG. **1***b*, it enters a locking groove **14** formed in the underside **16** of [30] the groove panel **2** and extending parallel to and spaced from the joint edge **4**. In FIG. **1***b*, the locking element **8** and the locking groove **14** together form a mechanical connection locking the panels **1**, **2** to each other in the direction designated D2. More specifically, the locking surface **10** of [35] the locking element **8** serves as a stop with respect to the surface of the locking groove **14** closest to the joint edge **4**.

When the panels **1** and **2** are joined together, they can however occupy such a relative position in the direction D2 that there is a small play Δ between the locking surface **10** [40] and the locking groove **14**. This mechanical connection in the direction D2 allows mutual displacement of the panels **1**, **2** in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action. [45]

As appears from FIGS. **4***a* and **4***b*, each panel in the system has a strip **6** at one long side **3** and a locking groove **14** at the other long side **4**, as well as a strip **6'** at one short side **3'** and a locking groove **14'** at the other short side **4'**.

Furthermore, the joint edge **3** of the strip panel **1** has in its [50] underside **18** a recess **20** extending throughout the entire joint edge **3** and forming together with the upper face **22** of the strip **6** a laterally open recess **24**. The joint edge **4** of the groove panel **2** has in its top side **26** a corresponding recess

28 forming a locking tongue **30** to be accommodated in the [55] recess **24** so as to form a mechanical connection locking the joint edges **3**, **4** to each other in the direction designated D1. This connection can be achieved with other designs of the joint edges **3**, **4**, for example by a bevel thereof such that the joint edge **4** of the groove panel **2** passes obliquely in [60] underneath the joint edge **3** of the strip panel **1** to be locked between that edge and the strip **6**.

The panels **1**, **2** can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again. [65]

The strip **6** is mounted in a tolerance equalizing groove **40** in the underside **18** of the strip panel **1** adjacent the joint

[8]

edge **3**. In this embodiment, the width of the equalizing groove **40** is approximately equal to half the width of the strip **6**, i.e. about 15 mm. By means of the equalizing groove **40**, it is ensured that there will always exist between the top side **21** of the panel **1** and the [5] bottom of the groove **40** an exact, predetermined distance E which is slightly smaller than the minimum thickness (2.8 mm) of the floor panels **1**, **2**. The groove panel **2** has a corresponding tolerance-equalizing surface or groove **42** in the underside **16** of the joint edge [10] **4**. The distance between the equalizing surface **42** and the top side **26** of the groove panel **2** is equal to the aforementioned exact distance E. Further, the thickness of the strip **6** is so chosen that the underside **44** of the strip is situated slightly below the undersides **18** and **16** [15] of the floor panels **1** and **2**, respectively. In this manner, the entire joint will rest on the strip **6**, and all vertical downwardly-directed forces will be efficiently transmitted to the subfloor **12** without any stresses being exerted on the joint edges **3**, **4**. Thanks to the provision [20] of the equalizing grooves **40**, **42**, an entirely even joint

will be achieved on the top side, despite the thickness tolerances of the panels **1**, **2**, without having to perform any grinding or the like across the whole panels. Especially, this obviates the risk of damage to the [25] bottom layer of the compact laminate, which might give rise to bulging of the panels.

Reference is now made to the embodiment of FIGS. **2***a-c* showing in a succession substantially the same laying method as in FIGS. **1***a* and **1***b*. The embodiment of FIGS. **2***a-c* primarily differs from the embodiment of FIGS. [30] **1***a* and **1***b* in that the strip **6** is mounted on the strip panel **1** by means of a mechanical connection instead of glue. To provide this mechanical connection, illustrated in more detail in FIG. **6**, a groove **50** is provided in the underside **18** of the strip panel [35] **1** at a distance from the recess **24**. The groove **50** may be formed either as a continuous groove extending throughout the entire length of the panel **1**, or as a number of separate grooves. The groove **50** defines, together with the recess **24**, a dovetail gripping edge **52**, the underside of which exhibits [40] an exact equalizing distance E to the top side **21** of the strip panel **1**. The aluminium strip **6** has a number of punched and bent tongues **54**, as well as one or more lips **56** which are bent round opposite sides of the gripping edge **52** in clamping arrangement therewith. This connection is shown in [45] detail from below in the perspective view of FIG. **6**.

Alternatively, a mechanical connection between the strip **6** and the strip panel **1** can be provided as illustrated in FIG. **7** showing in section a cut-away part of the strip panel **1** turned upside down. In FIG. **7**, the mechanical connection [50] comprises a dovetail recess **58** in the underside **18** of the strip panel **1**, as well as tongues/lips **60** punched and bent from the strip **6** and clamping against opposing inner sides of the recess **58**.

The embodiment of FIGS. **2***a-c* is further characterised in [55] that the locking element **8** of the strip **6** is designed as a

component bent from the aluminium sheet and having an operative locking surface **10** extending at right angles up from the front side **22** of the strip **6** through a height of e.g. 0.5 mm, and a rounded guide surface **34** facilitating the [60] insertion of the locking element **8** into the locking groove **14** when angling down the groove panel **2** towards the subfloor **12** (FIG. 2*b*), as well as a portion **36** which is inclined towards the subfloor **12** and which is not operative in the laying method illustrated in FIGS. 2*a-c*. [65]

Further, it can be seen from FIGS. 2*a-c* that the joint edge **3** of the strip panel **1** has a lower bevel **70** which cooperates

[9]

during laying with a corresponding upper bevel **72** of the joint edge **4** of the groove panel **2**, such that the panels **1** and **2** are forced to move vertically towards each other when their joint edges **3**, **4** are moved up to each other and the panels are pressed together horizontally. [5]

Preferably, the locking surface **10** is so located relative to the joint edge **3** that when the groove panel **2**, starting from the joined position in FIG. 2*c*, is pressed horizontally in the direction D2 against the strip panel **1** and is turned angularly up from the strip **6**, the maximum distance between the axis [10] of rotation A of the groove panel **2** and the locking surface **10** of the locking groove is such that the locking element **8** can leave the locking groove **14** without coming into contact with it.

FIGS. 3*a*-3*b* show another joining method for mechanically [15] joining together the floor panels of FIGS. 2*a-c*. The method illustrated in FIGS. 3*a-c* relies on the fact that the strip **6** is resilient and is especially useful for joining together the short sides of floor panels which have already been joined along one long side as illustrated in FIGS. 2*a-c*. The [20] method of FIGS. 3*a-c* is performed by first placing

the two panels **1** and **2** flat on the subfloor **12** and then moving them horizontally towards each other according to FIG. 3*b*. The inclined portion **35** of the locking element **8** then serves as a guide surface which guides the joint edge **4** of the groove [25] panel **2** up on to the upper side **22** of the strip **6**. The strip **6** will then be urged downwards while the locking element **8** is sliding on the equalizing surface **42**. When the joint edges **3**, **4** have been brought into complete engagement with each other horizontally, the locking element **8** will snap [30] into the locking groove **14** (FIG. 3*c*), thereby providing the same locking as in FIG. 2*c*. The same locking method can also be used by placing, in the initial position, the joint edge **4** of the groove panel with the equalizing groove **42** on the locking element **10** (FIG. 3*a*). The inclined portion **36** of the [35] locking element **10** then is not operative. This technique thus makes it possible to lock the floor panels mechanically in all directions, and by repeating the laying operations the whole floor can be laid without using any glue.

The invention is not restricted to the preferred embodiments [40] described above and illustrated in the drawings, but several variants and modifications thereof are conceivable within the scope of the appended claims. The strip **6** can be divided into small sections covering the major part of the joint length. Further, the thickness of the strip **6** may vary [45] throughout its width. All strips, locking grooves, locking elements and recesses are so dimensioned as to enable laying the floor panels with flat top sides in a manner to rests on the strip **6** in the joint. If the floor panels consist of compact laminate and if silicone or any other sealing [50] compound, a rubber strip or any other sealing device is applied prior to laying between the flat projecting part of the strip **6** and the groove panel **2** and or in the recess **26**, a moisture-proof floor is obtained.

As appears from FIG. **6**, an underlay **46**, e.g. of floor [55] board, foam or felt, can be mounted on the underside of the

panels during the manufacture thereof. In one embodiment, the underlay **46** covers the strip **6** up to the locking element **8**, such that the joint between the underlays 46 becomes offset in relation to the joint between the joint edges **3** and [60] **4**.

In the embodiment of FIG. **5**, the strip **6** and its locking element **8** are integrally formed with the strip panel **1**, the projecting part of the strip **6** thus forming an extension of the lower part of the joint edge **3**. The locking function is the [65] same as in the embodiments described above. On the underside **18** of the strip panel **1**, there is provided a separate strip,

[10]

band or the like **74** extending throughout the entire length of the joint and having, in this embodiment, a width covering approximately the same surface as the separate strip **6** of the previous embodiments. The strip **74** can be provided directly on the rear side **18** or in a recess formed therein (not shown), [5] so that the distance from the front side **21**, **26** of the floor to the rear side **76**, including the thickness of the strip **74**, always is at least equal to the corresponding distance in the panel having the greatest thickness tolerance. The panels **1**, **2** will then rest, in the joint, on the strip **74** or only on the [10] undersides **18**, **16** of the panels, if these sides are made plane.

When using a material which does not permit downward bending of the strip **6** or the locking element **8**, laying can be performed in the way shown in FIG. **5**. A floor panel **2*a*** [15] is moved angled upwardly with its long side **4*a*** into engagement with the long side **3** of a previously laid floor panel **1** while at the same time a third floor panel **2*b*** is moved with its short side **4*b***' into engagement with the short side **3*a***' of the upwardly-angled floor panel **2*a*** and is fastened by [20] angling the panel **2*b*** downwards. The panel **2*b*** is then pushed along the short side **3*a***' of the upwardly-angled floor panel **2*a***

until its long side **4***b* encounters the long side **3** of the initially-laid panel **1**. The two upwardly-angled panels **2***a* and **2***b* are therefore angled down on the subfloor **12** so [25] as to bring about locking.

By a reverse procedure the panels can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again.

Several variants of preferred laying methods are conceivable. [30] For example, the strip panel can be inserted under the groove panel, thus enabling the laying of panels in all four directions with respect to the initial position.

I claim:

1. A method of laying and mechanically joining floor [35] panels in parallel rows, wherein relative positions of the panels during the method can be defined as including first and second mutual positions, a first mutual position in which (i) the two panels are held in an angled position relative to each other and (ii) upper portions of adjacent edges of the [40] two panels are in mutual contact, and a second mutual position in which the two panels are (i) located in a common plane, (ii) mechanically locked to each other in a first direction that is at right angles to the common plane, (iii) mechanically locked to each other in a second direction, that [45] is at right angles to said first direction and to the adjacent joint edges, as a result of a first locking member disposed at one of the adjacent edges being connected to a second locking member disposed at the other one of the adjacent edges, and (iv) being displaceable in relation to each other [50] in the direction of the adjacent joint edges, wherein said method comprises the steps of:

(a) bringing a new one of the panels into an intermediary position where (i) a previously laid first one of the panels is located in a first row, (ii) a second one of the [55] panels is located in a second row and is in said first mutual position in relation to the first

panel, and (iii) the new panel is located in the second row and is in said second mutual position in relation to the second panel and is in a position relative to the first panel such that [60] a mutual distance is present between the upper portions of the adjacent joint edges of the new panel and the first panel;

(b) while maintaining said second mutual position between the new panel and the second panel, displacing [65] the new panel relative to the second panel into said first mutual position in relation to the first panel; and

[11]

(c) angling the new panel and the second panel together into said second mutual position in relation to the first panel.

2. The method according to claim **1**, wherein the first locking member is a locking groove and the second locking [5] member is a locking element which is received in the locking groove.

3. The method according to claim **1**, wherein said step of bringing the new panel into the intermediary position comprises the step of bringing the new panel and the second [10] panel into said first mutual position in relation to each other and then angling the new panel into said second mutual position in relation to the second panel.

4. The method according to claim **3**, wherein the first locking member is a locking element which is received in [15] the second locking member which is a locking groove.

5. A method of producing a floor by laying and mechanically joining floor panels in parallel rows, wherein said method comprises the steps of:

(a) providing floor panels wherein relative positions of the [20] panels during the method can be defined to

include first and second mutual positions, a first mutual position in which (i) two adjacent panels are held in an angled position relative to each other and (ii) upper portions of adjacent edges of the two panels are in mutual contact, [25] and a second mutual position in two adjacent panels are (i) located in a common plane, (ii) mechanically locked to each other in a first direction that is at right angles to the common plane, (iii) mechanically locked to each other in a second direction, that is at right angles to said [30] first direction and to the adjacent joint edges, as a result of a first locking member disposed at one of the adjacent edges being connected to a second locking member disposed at the other one of the adjacent edges, and (iv) being displaceable in relation to each other in [35] the direction of the adjacent joint edges,

(b) bringing a new one of the panels into an intermediary position where (i) a previously laid first one of the panels is located in a first row, (ii) a second one of the panels is located in a second row and is in said first [40] mutual position in relation to the first panel, and (iii) the new panel is located in the second row and is in said second mutual position in relation to the second panel and is in a position relative to the first panel such that a mutual distance is present between the upper portions [45] of the adjacent joint edges of the new panel and the first panel;

(c) while maintaining said second mutual position between the new panel and the second panel, displacing the new panel relative to the second panel into said first [50] mutual position in relation to the first panel; and

(d) angling the new panel and the second panel together into said second mutual position in relation to the first panel.

6. The method according to claim **5**, wherein the first [55] locking member is a locking groove and the second locking member is a locking element which is received in the locking groove.

7. The method according to claim **5**, wherein said step of bringing the new panel into the intermediary position comprises [60] the step of bringing the new panel and the second panel into said first mutual position in relation to each other and then angling the new panel into said second mutual position in relation to the second panel.

8. The method according to claim **7**, wherein the first [65] locking member is a locking element which is received in the second locking member which is a locking groove.

[12]

9. A method of laying and mechanically joining rectangular floor panels in parallel rows, the method comprising the steps of:

(a) placing a new one of the panels adjacent to one edge of a previously laid first one of the panels in a first row [5] and adjacent to another edge of a previously laid second one of the panels in an adjacent second row, such that the new panel is spaced from a final position relative to both the first and second panels;

(b) displacing the new panel towards the first panel such [10] that a locking element of a resilient locking strip disposed at one of the new panel and the first panel snaps up into a locking groove disposed at the other one of the new panel and the first panel and to thereby mechanically lock together the new and first panels in [15] a first direction that is at right angle to a principal plane of the first panel and in a second direction that is at right angles to the first direction

and to the thus connected set of edges of the new panel and the first panel; and

(c) displacing the new panel relative to the first panel in [20] a direction parallel with said connected set of edges, while maintaining the new and first panels locked together in said first and second directions, towards a final position until a locking element of a resilient locking strip disposed at one of an another edge of the [25] new panel and said another edge of the second panel snaps up into a locking groove disposed at the one of the another edges, whereby the new panel and the second panel are mechanically locked to each other in both the first direction and the second direction with [30] respect to the thus connected set of another edges.

10. A method as claimed in claim 9, wherein the new panel is placed in the same first row as the first panel.

11. A method as claimed in claim 9, wherein the new panel is placed in the same second row as the second panel. [35]

12. A method of laying and mechanically joining floor panels in parallel rows, wherein each two adjacent panels of the panels are arranged to be brought into a mechanically locked mutual position by placing the panels at a mutual distance in a common plane and displacing one of the panels [40] into engagement with the other one in a direction that is at right angles to adjacent edges of the two panels, in which mechanically locked mutual position the two panels are (i) located in the common plane, (ii) mechanically locked to each other in a first direction that is at right angles to the [45] common plane, (iii) mechanically locked to each other in a second direction, that is at right angles to said first direction and to the adjacent joint edges, as a result of a first locking member disposed at one of the adjacent edges being connected to a second locking member disposed at the other one [50] of

the adjacent edges, and (iv) being displaceable in relation to each other in the direction of the adjacent joint edges, wherein said method comprises the steps of:

(a) placing a new one of the panels adjacent to a previously laid first one of the panels in a first row and [55] adjacent to a previously laid second one of the panels in an adjacent second row, such that the new panel is spaced from a final position relative to both the first and second panels;

(b) displacing the new panel towards the first panel until [60] the new panel and the first panel have been brought into said locked position; and

(c) displacing the new panel relative to the first panel and towards the second panel while maintaining the new panel and the first panel in the locked mutual position. [65]

13. A method for disassembling floor panels which have been mechanically joined in parallel rows, wherein two

[13]

adjacent panels of the panels are arranged to occupy first and second mutual positions, a first mutual position in which (i) the two panels are held in an angled position relative to each other and (ii) upper portions of adjacent edges of the two panels are in mutual contact, and a second mutual [5] position in which the two panels are (i) located in a common plane, (ii) mechanically locked to each other in a first direction that is at right angles to the common plane, (iii) mechanically locked to each other in a second direction, that is at right angles to said first direction and to the adjacent joint edges, [10] as a result of a first locking member disposed at one of the adjacent edges being connected to a second locking member disposed at the other one of the adjacent edges, and (iv) being displaceable in relation to each other in the direction of the

adjacent joint edges, wherein said method comprises [15] the following steps for taking up a given panel located in a given row, said given panel being in said second mutual position in relation to an adjacent first panel in an adjacent row and also in said second mutual position in relation to an adjacent second panel in the given row;

[14]

(a) angling the given panel and the second panel together into said first mutual position in relation to the first panel; and then

(b) while maintaining said second mutual position between the given panel and the second panel, displacing [5] the given panel relative to the second panel in a direction away from the first panel.

14. A method as claimed in claim **13**, wherein said step of displacing the given panel relative to the second panel in a [10] direction away from the first panel is performed to such an extent that the given panel and the second panel are still in said second mutual position at the end of said step of displacing, said method further comprising the subsequent the step of angling the given panel in relation to the second [15] panel in order to release the given panel from the second panel.

* * * * *

APPENDIX F

UNITED STATES PATENT

Patent No. 5,860,267

See Fold Out Exhibit
Diagrams

US005860267A

United States Patent [19]

Pervan

[11] Patent Number: 5,860,267

[45] Date of Patent: Jan. 19, 1999

[54] **METHOD FOR JOINING BUILDING BOARDS**

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[73] Assignee: **Valinge Aluminum AB**, Viken, Sweden

[21] Appl. No.: **3,499**

[22] Filed: **Jan. 6, 1998**

Related U.S. Application Data

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[30] **Foreign Application Priority Data**

May 10, 1993 [SE] Sweden 9301595

[51] **Int. Cl.**[6] **E04B 1/12**

[52] **U.S. Cl.** **52/748.1**; 52/747.1; 52/747.11; 52/403.1; 52/480; 52/506.05; 52/551; 52/582.1; 52/592.2

[58] **Field of Search** 52/745.05, 745.21, 52/747.1, 747.11, 748.1, 403.1, 480, 506.05, 551, 582.1, 591.3, 592.2

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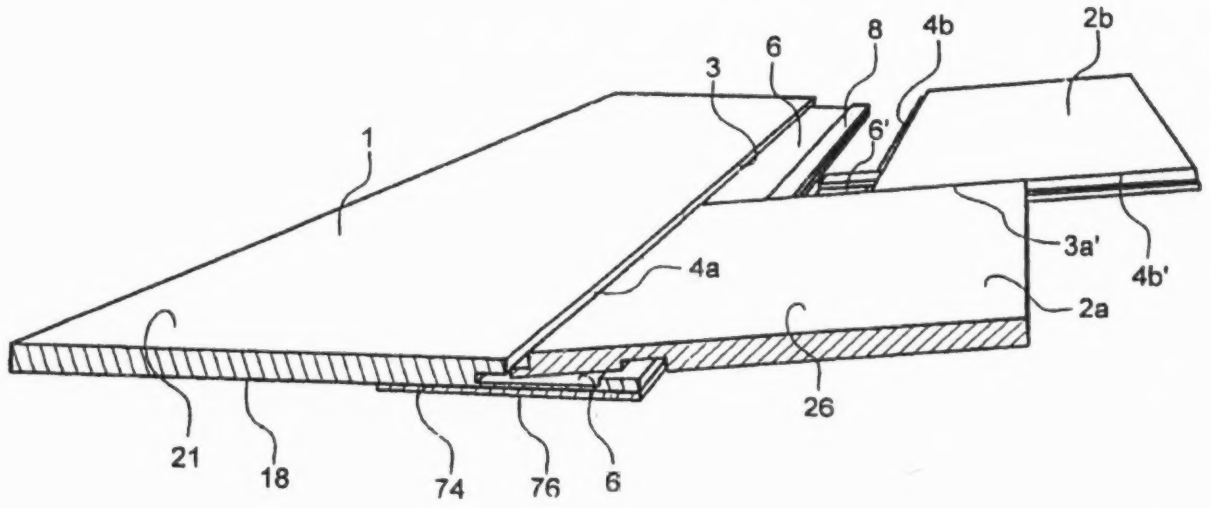
Primary Examiner—Christopher Kent
Assistant Examiner—Yvonne Horton-Richardson
Attorney, Agent, or Firm—Burns, Doane, Swecker & Mathis, L.L.P.

[57] **ABSTRACT**

A method for laying and mechanically joining rectangular building panels in parallel rows includes the steps of (a) placing a new one of the panels adjacent to a long edge of a previously laid first one of the panels in a first row and to a short edge of a previously laid second one of the panels in an adjacent second row, such that the new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position relative to said second panel and such that the long edge of the new panel is provided with a locking groove which is placed upon and in contact with a locking strip at the adjacent long edge of the first panel; (b) subsequently angling down the new one of the panels so as to accommodate a locking element of the strip of the first panel in the locking groove of the new panel, whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked together in a first direction also; and (c) displacing the new one of the panels in its longitudinal direction relative to the first panel towards a final longitudinal position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of the other one of the short edges, whereby the new one of the panels and the second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected short edges.

42 Claims, 6 Drawing Sheets



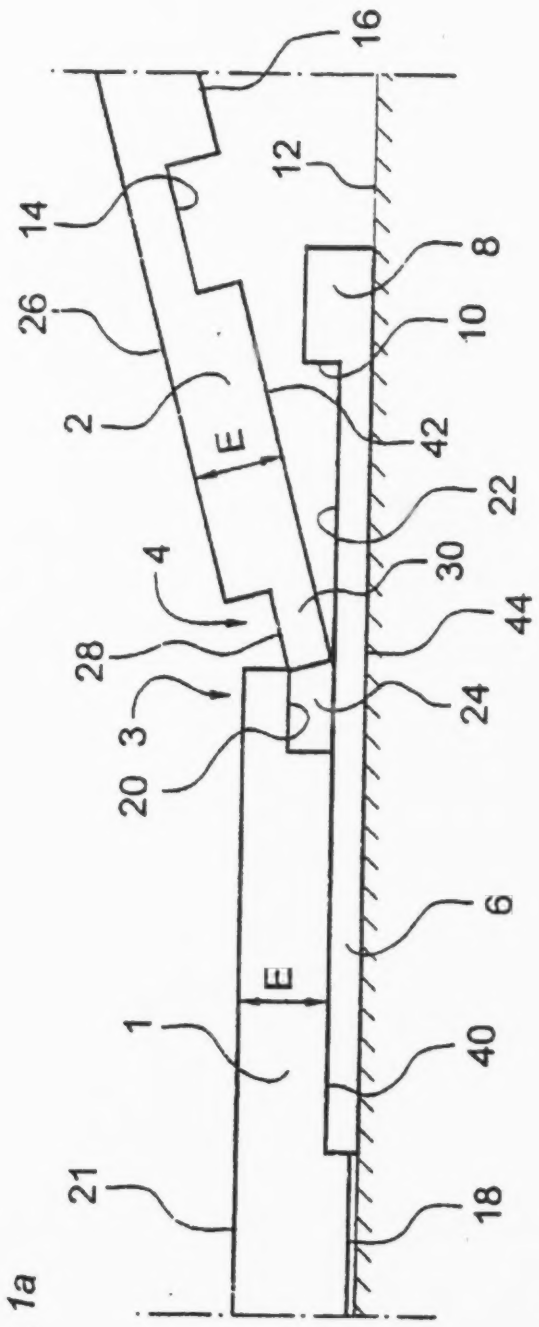

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Fig. 1a

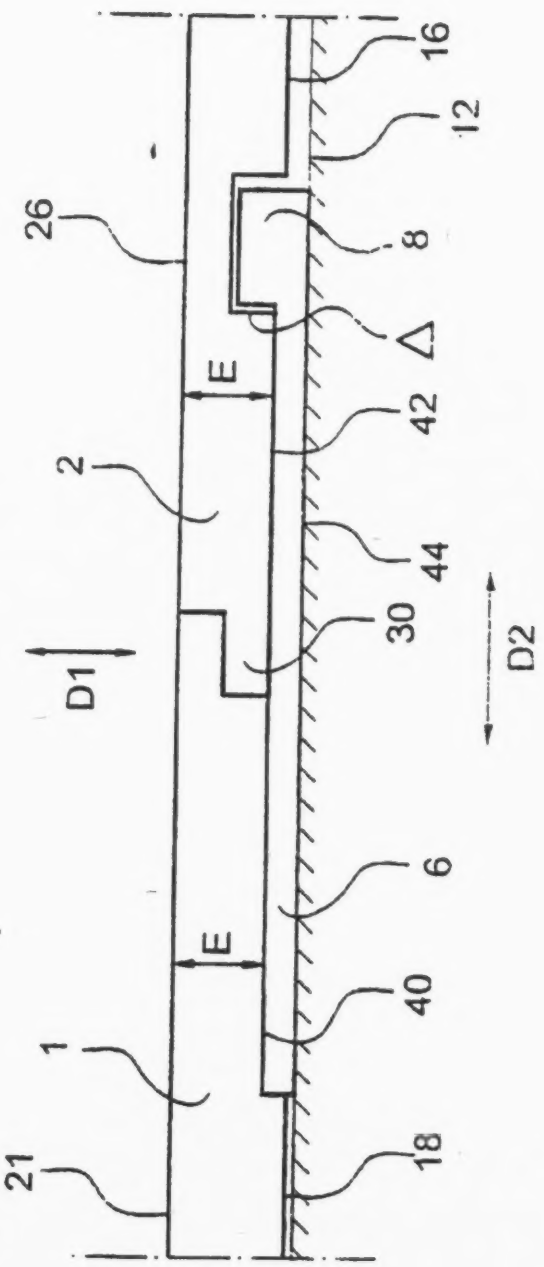
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Fig. 1b

Fig. 2a

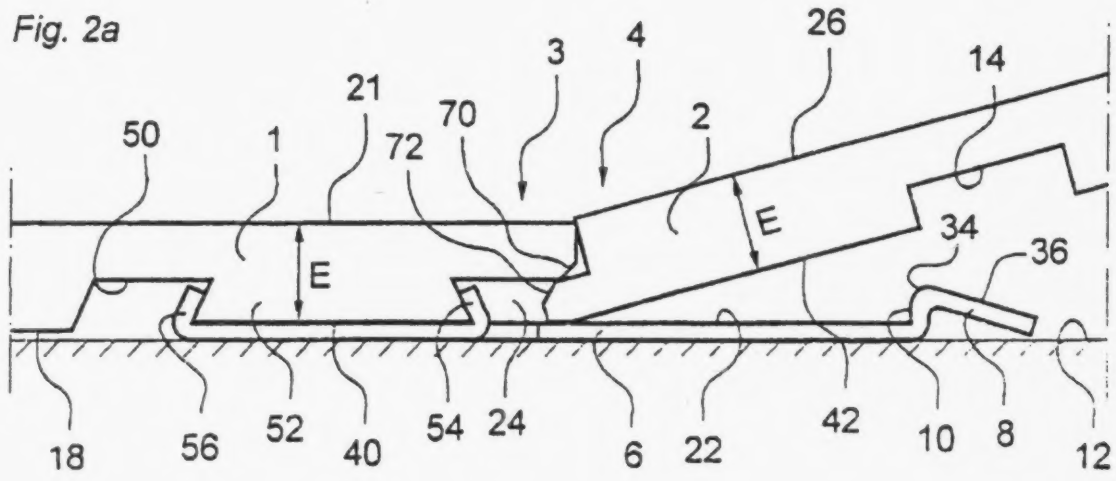


Fig. 2b

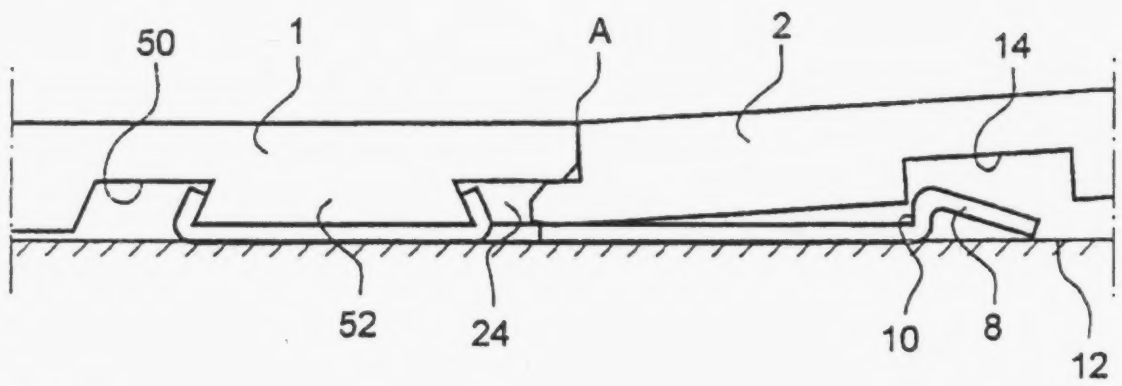


Fig. 2c

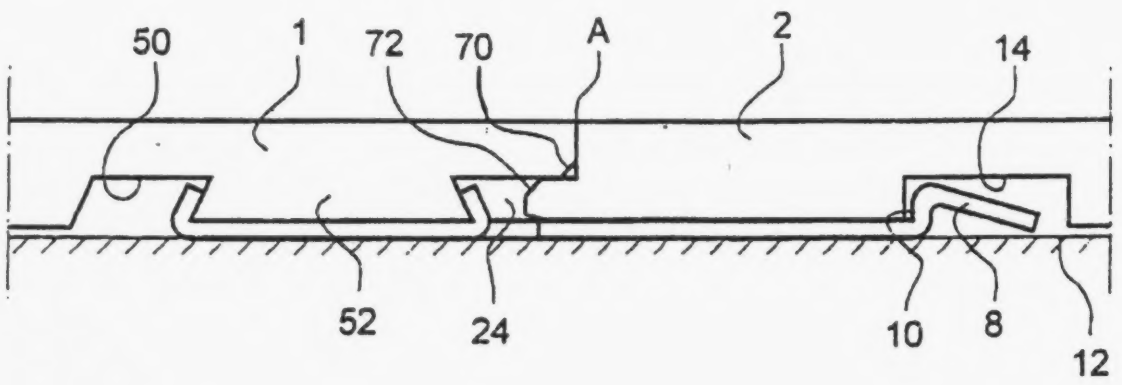


Fig. 3a

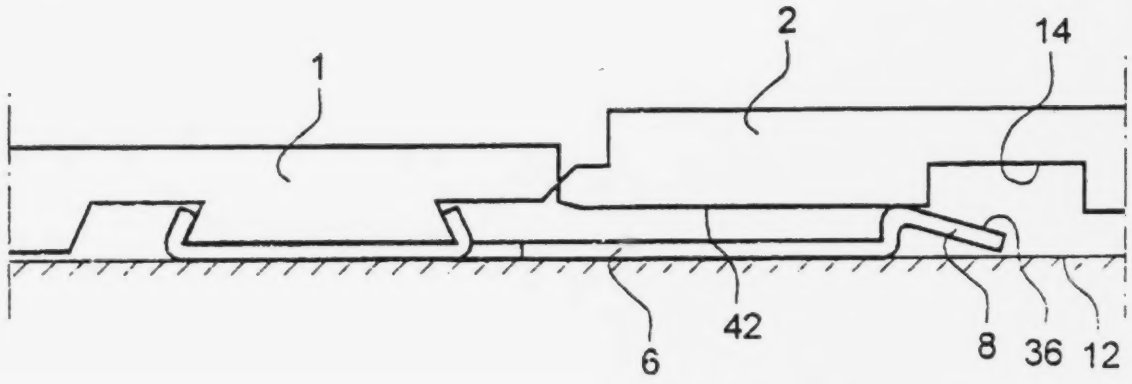


Fig. 3b

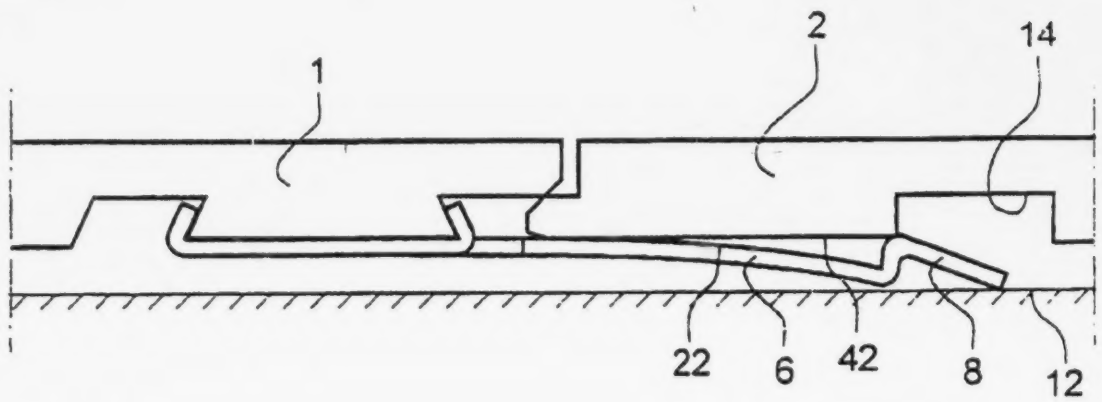


Fig. 3c

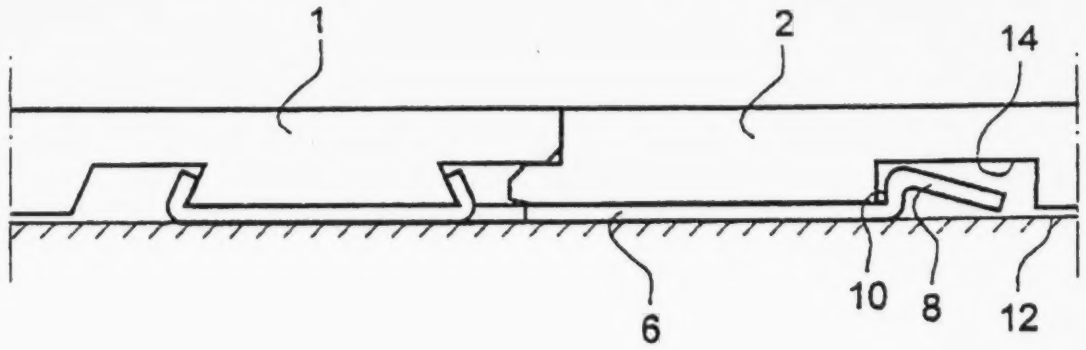


Fig. 4a

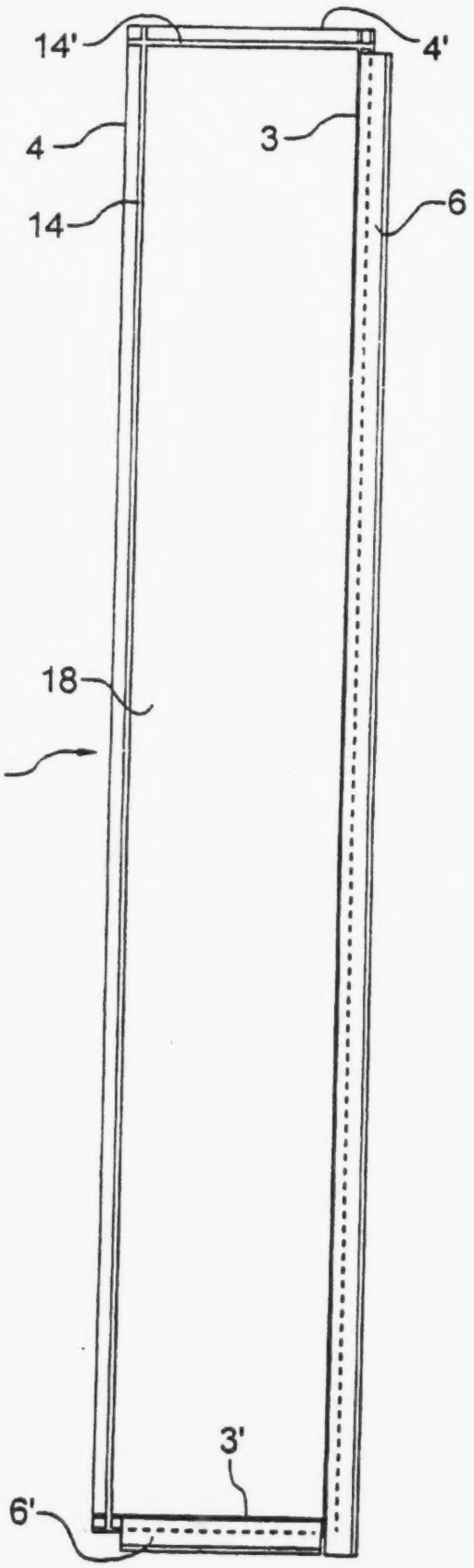
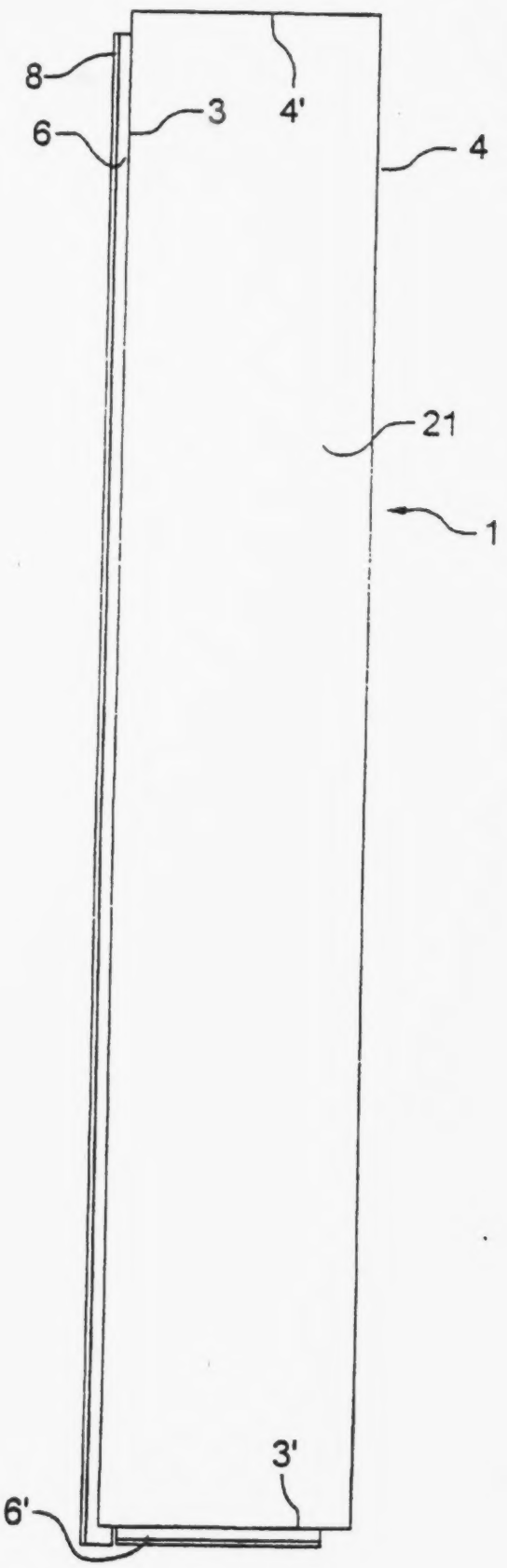


Fig. 4b



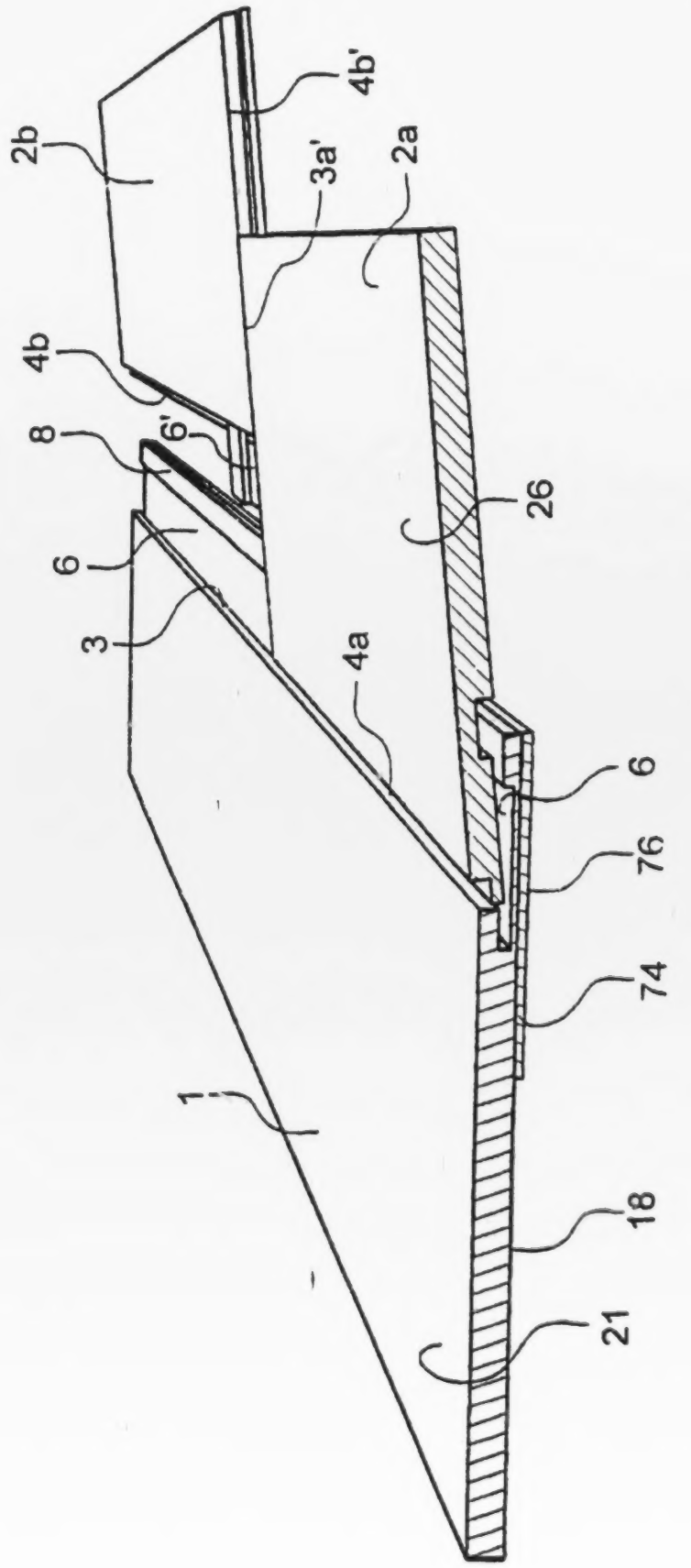


Fig. 5

Fig. 6

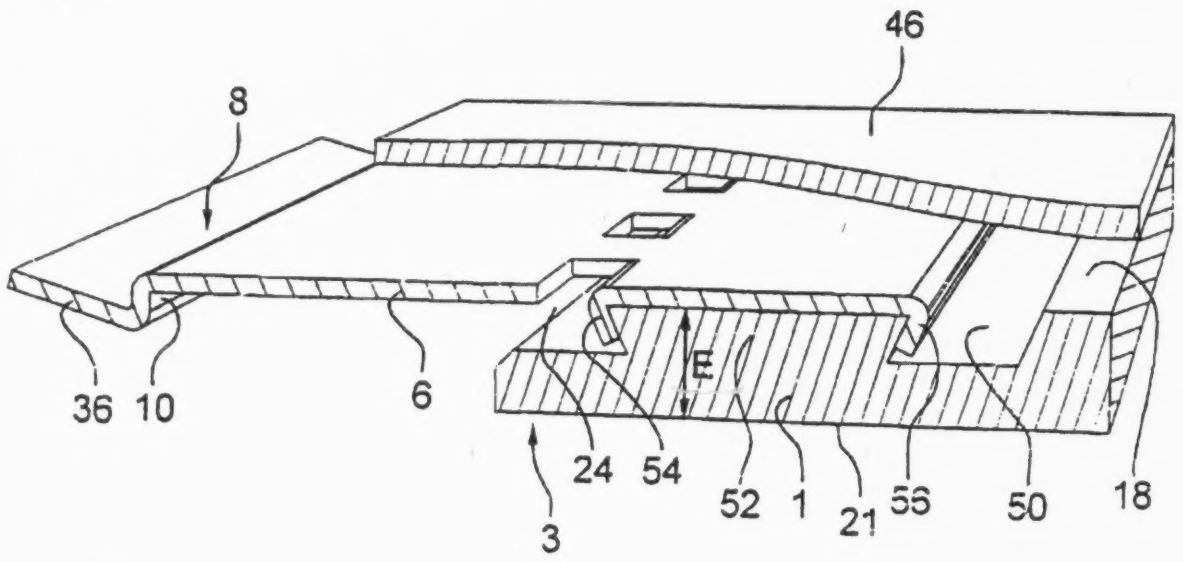
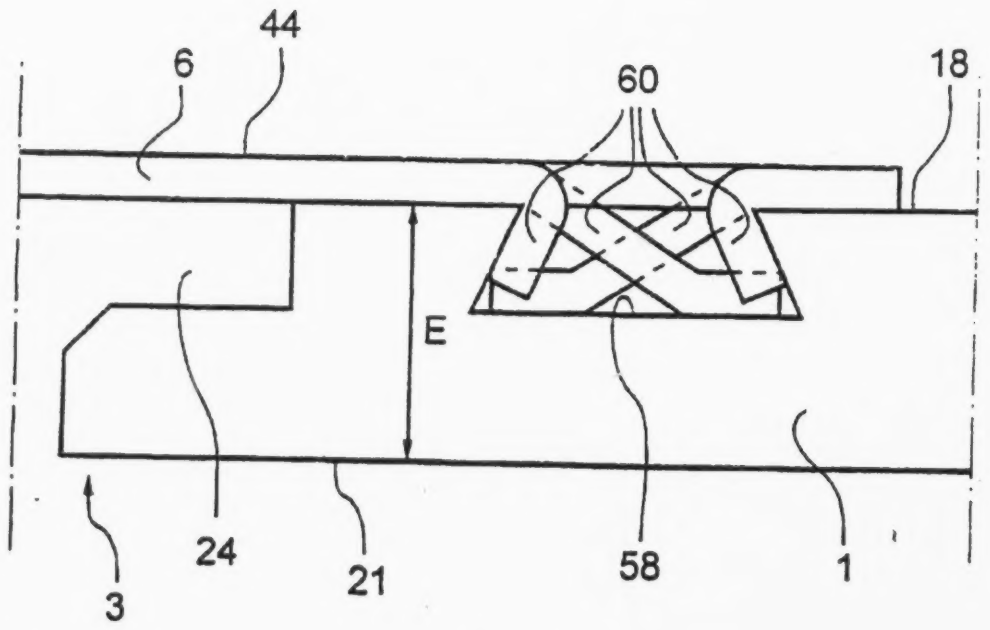


Fig. 7



5,860,267

[1]

METHOD FOR JOINING BUILDING BOARDS

This application is a divisional, of application Ser. No. 08/436,224, filed May 17, 1995, now U.S. Pat. No. 5,706,621. [5]

TECHNICAL FIELD

The invention generally relates to a system for providing a joint along adjacent joint edges of two building panels, [10] especially floor panels.

More specifically, the joint is of the type where the adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, [15] and where a locking device forms a second mechanical connection locking the panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges, the locking device comprising a locking groove which extends parallel to and spaced from the joint [20] edge of one of the panels, and said locking groove being open at the rear side of this one panel.

The invention is especially well, suited for use in joining floor panels, especially thin laminated floors. Thus, the following description of the prior art and of the objects and [25] features of the invention will be focused on this field of use. It should however be emphasised that the invention is useful also for joining ordinary wooden floors as well as other types of building panels, such as wall panels and roof slabs. [30]

BACKGROUND OF THE INVENTION

A joint of the aforementioned type is known, e.g. from SE 450,141. The first mechanical connection is achieved by means of joint edges having tongues and grooves. [35] The locking device for the second mechanical connection comprises two oblique locking grooves, one in the rear side of each panel, and a plurality of spaced-apart spring clips which are distributed along the joint and the legs of which are pressed into the grooves, and which are biased so as to [40] tightly clamp the floor panels together. Such a joining technique is especially useful for joining thick floor panels to form surfaces of a considerable expanse.

Thin floor panels of a thickness of about 7-10 mm, especially laminated floors, have in a short time taken a [45] substantial share of the market. All thin floor panels employed are laid as "floating floors" without being attached to the supporting structure. As a rule, the dimension of the floor panels is 200×1200 mm, and their long and short sides are formed with tongues and grooves. Traditionally, the floor [50] is assembled by applying glue in the groove and forcing the floor panels together. The tongue is then glued in the groove of the other panel. As a rule, a laminated floor consists of an upper decorative wear layer of laminate having a thickness of about 1 mm, an intermediate core of laminate board Cr [55] other board, and a base layer to balance the construction. The core has essentially poorer properties than the laminate, e.g. in respect of hardness and water resistance, but it is nonetheless needed primarily for providing a groove and tongue for assemblage. This means that the overall thickness [60] must be at least about 7 mm. These known laminated floors using glued tongue-and-groove joints however suffer from several inconveniences.

First, the requirement of an overall thickness of at least about 7 mm entails an undesirable restraint in connection [65]

with the laying of the floor, since it is easier to cope with low thresholds when using thin floor panels, and doors must

[2]

often be adjusted in height to come clear of the floor laid. Moreover, manufacturing costs are directly linked with the consumption of material.

Second, the core must be made of moisture-absorbent material to permit using water-based glues when laying the [5] floor. Therefore, it is not possible to make the floors thinner using so-called compact laminate, because of the absence of suitable gluing methods for such non-moisture-absorbent core materials.

Third, since the laminate layer of the laminated floors is [10] highly wear-resistant, tool wear is a major problem when working the surface in connection with the formation of the tongue.

Fourth, the strength of the joint, based on a glued tongue-and-groove connection, is restricted by the properties of the [15] core and of the glue as well as by the depth and height of the groove. The laying quality is entirely dependent on the gluing. In the event of poor gluing, the joint will open as a result of the tensile stresses which occur e.g. in connection with a change in air humidity. [20]

Fifth, laying a floor with glued tongue-and-groove joints is time-consuming, in that glue must be applied to every panel on both the long and short sides thereof.

Sixth, it is not possible to disassemble a glued floor once laid, without having to break up the joints. Floor panels that [25] have been taken up cannot therefore be used again. This is a drawback particularly in rental houses where the flat concerned must be put back into the initial state of occupancy. Nor can damaged or worn-out panels be replaced without extensive efforts, which would be particularly desirable [30]

on public premises and other areas where parts of the floor are subjected to great wear.

Seventh, known laminated floors are not suited for such use as involves a considerable risk of moisture penetrating down into the moisture-sensitive core. [35]

Eighth, present-day hard, floating floors require, prior to laying the floor panels on hard subfloors, the laying of a separate underlay of floor board, felt, foam or the like, which is to damp impact sounds and to make the floor more pleasant to walk on. The placement of the underlay is [40] complicated operation, since the underlay must be placed in edge-to-edge fashion. Different under-lays affect the properties of the floor.

There is thus a strongly-felt need to overcome the above-mentioned drawbacks of the prior art. It is however not [45] possible simply to use the known joining technique with glued tongues and grooves for very thin floors, e.g. with floor thicknesses of about 3 mm, since a joint based on a tongue-and-groove connection would not be sufficiently strong and practically impossible to produce for such thin [50] floors. Nor are any other known joining techniques usable for such thin floors. Another reason why the making of thin floors from e.g. compact laminate involves problems is the thickness tolerances of the panels, being about 0.2-0.3 mm for a panel thickness or about 3 mm. A 3-mm compact [55] laminate panel having such a thickness tolerance would have, if ground to uniform thickness on its rear side, an unsymmetrical design, entailing the risk of bulging. Moreover, if the panels have different thicknesses, this also means that the joint will be subjected to excessive load. [60]

Nor is it possible to overcome the above-mentioned problems by using double-adhesive tape or the like on the undersides of the panels, since such a connection catches directly and does not allow for subsequent adjustment of the panels as is the case with ordinary gluing. [65]

Using U-shaped clips of the type disclosed in the above-mentioned SE 450,141, or similar techniques, to overcome

[3]

the drawbacks discussed above is no viable alternative either. Especially biased clips of this type cannot be used for joining panels of such a small thickness as 3 mm. Normally, it is not possible to disassemble the floor panels without having access to their undersides. This known technology [5] relying on clips suffers from the additional drawbacks:

Subsequent adjustment of the panels in their longitudinal direction is a complicated operation in connection with laying, since the clips urge the panels tightly against each other. [10]

Floor laying using clips is time-consuming.

This technique is usable only in those cases where the floor panels are resting on underlying joists with the clips placed therebetween. For thin floors to be laid on [15] a continuous, flat supporting structure, such clips cannot be used.

The floor panels can be joined together only at their long sides. No clip connection is provided on the short sides. [20]

TECHNICAL PROBLEMS AND OBJECTS OF THE INVENTION

A main object of the invention therefore is to provide a system for joining together building panels, especially floor panels for hard, floating floors, which allows using floor [25] panels of a smaller overall thickness than present-day floor panels.

A particular object of the invention is to provide a panel-joining system which [30]

makes it possible in a simple, cheap and rational way to provide a joint between floor panels without requiring the use of glue, especially a joint based primarily only on mechanical connections between the panels;

can be used for joining floor panels which have a smaller [35] thickness than present-day laminated floors and which have, because of the use of a different core material, superior properties than present-day floors even at a thickness of 3 mm;

makes it possible between thin floor panels to provide a [40] joint that eliminates any unevennesses in the joint because of thickness tolerances of the panels;

allows joining all the edges of the panels;

reduces tool wear when manufacturing floor panels with hard surface layers; [45]

allows repeated disassembly and reassembly of a floor previously laid, without causing damage to the panels, while ensuring high laying quality;

makes it possible to provide moisture-proof floors; [50]

makes it possible to obviate the need of accurate, separate placement of an underlay before laying the floor panels; and

considerably cuts the time for joining the panels.

These and other objects of the invention are achieved by [55] means of a panel-joining system having the features recited in the appended claims.

Thus, the invention provides a system for making a joint along adjacent joint edges of two building panels, especially floor panels, in which joint: [60]

the adjacent joint edges together form a first mechanical connection locking the joint edges to each

other in a first direction at right angles to the principal plane of the panels, and

a locking device arranged on the rear side of the panels [65] forms a second mechanical connection locking the panels to each other in a second direction parallel to the

[4]

principal plane and at right angles to the joint edges, said locking device comprising a locking groove which extends parallel to and spaced from the joint edge of one of said panels, termed groove panel, and which is open at the rear side of the groove panel, said system [5] being characterised in

that the locking device further comprises a strip integrated with the other of said panels, termed strip panel, said strip extending throughout substantially the entire length of the joint edge of the strip panel and being [10] provided with a locking element projecting from the strip, such that when the panels are joined together, the strip projects on the rear side of the groove panel with its locking element received the locking groove of the groove panel, [15]

that the panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection, [20]

that the first and the second mechanical connection both allow mutual displacement of the panels in the direction of the joint edges, and

that the second mechanical connection is so conceived as to allow the locking element to leave the

locking [25] groove if the groove panel is turned about its joint edge angularly away from the strip.

The term "rear side" as used above should be considered to comprise any side of the panel located behind/underneath the front side of the panel. The opening plane of the locking [30] groove of the groove panel can thus be located at a distance from the rear surface of the panel resting on the supporting structure. Moreover, the strip, which in the invention extends throughout substantially the entire length of the joint edge of the strip panel, should be considered to encompass [35] both the case where the strip is a continuous, uninterrupted element, and the case where the "strip" consists in its longitudinal direction of several parts, together covering the main portion of the joint edge.

It should also be noted (i) that it is the first the second [40] mechanical connection as such that permit mutual displacement of the panels in the direction of the joint edges, and that (ii) it is the second mechanical connection as such that permits the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly [45] away from the strip. Within the scope of the invention, there may thus exist means, such as glue and mechanical devices, that can counteract or prevent such displacement and/or upward angling.

The system according to the invention makes it possible [50] to provide concealed, precise locking of both the short and long sides of the panels in hard, thin floors. The floor panels can be quickly and conveniently disassembled in the reverse order of laying without any risk of damage to the panels, ensuring at the same time a high laying quality. The panels [55] can be assembled and disassembled much faster than in present-day systems, and any damaged or worn-out panels can be replaced by taking up and re-laying parts of the floor.

According to an especially preferred embodiment of the invention, a system is provided which permits precise joining [60] of thin floor panels having, for example, a thickness of the order of 3 mm and which at the same time provides a tolerance-independent smooth top face at the joint. To this end, the strip is mounted in an equalising groove which is countersunk in the rear side of the strip panel and which [65] exhibits an exact, predetermined distance from its bottom to the front side of the strip panel. The part of the strip

[5]

projecting behind the groove panel engages a corresponding equalising groove, which is countersunk in the of the groove panel and which exhibits the same exact, predetermined distance from its bottom to the front side of the groove panel. The thickness of the strip is at least so great that the rear side [5] of the strip is flush with, and preferably projects slightly below the rear side of the panels. In this embodiment, the panels will always rest, in the joint, with their equalising grooves on a strip. This levels out the tolerance and imparts the necessary strength to the joint. The strip transmits [10] horizontal and upwardly-directed forces to the panels and downwardly-directed forces to the existing subfloor.

Preferably, the strip may consist of a material which is flexible, resilient and strong, and can be sawn. A preferred strip material is sheet aluminum. In an aluminum strip, [15] sufficient strength can be achieved with a strip thickness of the order of 0.5 mm.

In order to permit taking up previously laid, joined floor panels in a simple way, a preferred embodiment of the invention is characterised in that when the groove panel is [20] pressed against the strip panel in the second direction and is turned angularly away from the strip, the maximum distance between the axis of rotation of the groove panel and

the locking surface of the locking groove closest to the joint edges is such that the locking element can leave the locking [25] groove without contacting the locking surface of the locking groove. Such a disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm.

According to the invention, the locking surface of the [30] locking element is able to provide a sufficient locking function even with very small heights of the locking surface. Efficient locking of 3-mm floor panels can be achieved with a locking surface that is as low as 2 mm. Even a 0.5-mm-high locking surface may provide sufficient locking. The [35] term "locking surface" as used herein relates to the part of the locking element engaging the locking groove to form the second mechanical connection.

For optimal function of the invention, the strip and the locking element should be formed on the strip panel with [40] high precision. Especially, the locking surface of the locking element should be located at an exact distance from the joint edge of the strip panel.

Furthermore, the extent of the engagement in the floor panels should be minimised, since it reduces the floor [45] strength.

By known manufacturing methods, it is possible to produce a strip with a locking pin, for example by extruding aluminum or plastics into a suitable section, which is thereafter glued to the floor panel or is inserted in special grooves. [50] These and all other traditional methods do however not ensure optimum function and an optimum level of economy. To produce the joint system according to the invention, the strip is suitably formed from sheet aluminum, and is mechanically fixed to the strip panel. [55]

The laying of the panels can be performed by first placing the strip panel on the subfloor and then moving the groove panel with its long side up to the long side of the strip panel,

at an angle between the principal plane of the groove panel and the subfloor. When the joint edges have been brought [60] into engagement with each other to form the first mechanical connection, the groove panel is angled down so as to accommodate the locking element in the locking groove.

Laying can also be performed by first, placing both the strip panel and the groove panel flat on the subfloor and then [65] joining the panels parallel to their principal planes while bending the strip downwards until the locking element snaps

[6]

up into the locking groove. This laying technique enables in particular mechanical locking of both the short and long sides of the floor panels. For example, the long sides can be joined together by using the first laying technique with downward angling of the groove panel, while the short sides [5] are subsequently joined together by displacing the groove panel in its longitudinal direction until its short side is pressed on and locked to the short side of an adjacent panel in the same row.

In connection with their manufacture, the floor panels can [10] be provided with an underlay of e.g. floor board, foam or felt. The underlay should preferably cover the strip such that the joint between the underlays is offset in relation to the joint between the floor panels.

The above and other features and advantages of the [15] invention will appear from the appended claims and the following description of embodiments of the invention.

The invention will now be described in more detail hereinbelow with reference to the accompanying drawing Figures. [20]

DESCRIPTION OF DRAWING FIGURES

FIGS. 1*a* and 1*b* schematically show in two stages how two floor panels of different thickness are joined together in floating fashion according to a first embodiment of the [25] invention.

FIGS. 2*a-c* show in three stages a method for mechanically joining two floor panels according to a second embodiment of the invention.

FIGS. 3*a-c* show in three stages another method for [30] mechanically joining the floor panels of FIGS. 2*a-c*.

FIGS. 4*a* and 4*b* show a floor panel according to FIGS. 2*a-c* as seen from below and from above, respectively.

FIG. 5 illustrates in perspective a method for laying and [35] joining floor panels according to a third embodiment of the invention.

FIG. 6 shows in perspective and from below a first variant for mounting a strip on a floor panel.

FIG. 7 shows in section a second variant for mounting a strip on a floor panel. [40]

DESCRIPTION OF PREFERRED EMBODIMENTS

FIGS. 1*a* and 1*b*, to which reference is now made, [45] illustrate a first floor panel 1, hereinafter termed strip panel, and a second floor panel 2, hereinafter termed groove panel. The terms "strip panel" and "groove panel" are merely intended to facilitate the description of the invention, the panels 1, 2 normally being identical in practice. The panels [50] 1 and 2 may be made from compact laminate and may have a thickness of about 3 mm with a thickness tolerance of about ± 0.2 mm. Considering this thickness tolerance, the panels 1, 2 are illustrated with different thicknesses (FIG. 1*b*), the strip panel 1 having a maximum thickness (3.2 mm) [55] and the groove panel 2 having a minimum thickness (2.8 mm).

To enable mechanical joining of the panels **1**, **2** at opposing joint edges, generally designated **3** and **4**, [60] respectively, the panels are provided with grooves and strips as described in the following.

Reference is now made primarily to FIGS. **1***a* and **1***b*, and secondly to FIGS. **4***a* and **4***b* showing the basic design of the floor panels from below, and from above, respectively. [65]

From the joint edge **3** of the strip panel **1**, i.e. the one long side, projects horizontally a flat strip **6** mounted at thee

[7]

factory on the underside of the strip panel **1** and extending throughout the entire edge **3**. The strip **6**, which is made of flexible, resilient sheet aluminum, can be fixed mechanically, by means of glue or in any other suitable a way. In FIGS. **1***a* and **1***b*, the strip **6** is glued, while in FIGS. [5] **4***a* and **4***b* it is mounted by means of a mechanical connection, which will be described in more detail hereinbelow.

Other strip materials can be used, such as sheets of other metals, as well as aluminum or plastics sections. [10] Alternatively, the strip **6** may be integrally formed with the strip panel **1**. At any rate, the strip **6** should be integrated with the strip panel **1** i.e. it should not be mounted on the strip panel **1** in connection with laying. As a non-restrictive example, the strip **6** may have a width of about 30 mm and [15] a thickness of about 0.5 mm.

As appears from FIGS. **4***a* and **4***b*, a similar, although shorter strip **6'** is provided also at one short side **3'** of the strip panel **1**. The shorter strip **6'** does however not extend throughout the entire short side **3'** but is otherwise identical [20] with the strip **6** and, therefore, is not described in more detail here.

The edge of the strip **6** facing away from joint edge **3** is formed, with a locking element **8** extended throughout the

entire strip **6**. The locking element **8** has a locking surface **10** [25] facing the joint edge **3** and having a height of e.g. 0.5 mm. The locking element **8** is so designed that when the floor is being laid and the strip panel **2** of FIG. **1***a* is pressed with its joint edge **4** against the joint edge **3** of the strip panel **1** and is angled down against the subfloor **12** according to FIG. **1***b*, [30] it enters a locking groove **14** formed in the underside **16** of the groove panel **2** and extending parallel to and spaced from the joint edge **4**. In FIG. **1***b*, the locking element **8** and the locking groove **14** together form a mechanical connection locking the panels **1**, **2** to each other in the direction [35] designated D2. More specifically, the locking surface **10** of the locking element **8** serves as a stop with respect to the surface of the locking groove **14** closest to the joint edge **4**.

When the panels **1** and **2** are joined together, they can however occupy such a relative position in the direction D2 [40] that there is a small play A between the locking surface **10** and the locking groove **14**. This mechanical connection in the direction D2 allows mutual displacement of the panels **1**, **2** in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by [45] snap action.

As appears from FIGS. **4***a* and **4***b*, each canal in the system has a strip **6** at one long side **3** and a locking groove **14** at the other long side **4**, as well as a strip **6'** at one short side **3'** and a locking groove **14'** at the other short side **4'**. [50]

Furthermore, the joint edge **3** of the strip panel **1** has in its underside **18** a recess **20** extending throughout the entire joint edge **3** and forming together with the upper face **22** off the strip **6** a laterally open recess **24**. The joint edge **4** of the [55] groove panel **2** has in its top side **26** a corresponding recess **28** forming a locking tongue **30** to be accommodated in the recess **24** so as to form a mechanical connection locking the joint edges **3**, **4** to each other in the direction designated D1.

This connection can be achieved with other designs of the [60] joint edges **3**, **4**, for example by a bevel thereof such that the joint edge **4** of the groove panel **2** passes obliquely in underneath the joint edge **3** of the strip panel **1** to be locked between that edge and the strip **6**.

The panels **1**, **2** can be taken up in the reverse order of [65] laying without causing any damage to the joint, and be laid again.

[8]

The strip **6** is mounted in a tolerance-equalising groove **40** in the underside **18** of the strip panel **1** adjacent the joint edge **3**. In this embodiment, the width of the equalizing groove **40** is approximately equal to half the width of the strip **6**, i.e. about 15 mm. By means of the equalising groove [5] **40**, it is ensured that there will always exist between the top side **21** of the panel **1** and the bottom of the groove **40** an exact, predetermined distance E which is slightly smaller than the minimum thickness (2.8 mm) of the floor panels **1**, **2**. The groove panel **2** has a corresponding tolerance- [10] equalising surface or groove **42** in the underside **16** of the joint edge **4**. The distance between the equalising surface **42** and the top side **26** of the groove panel **2** is equal to the aforementioned exact distance E. Further, the thickness of the strip **6** is so chosen that the underside **44** of the strip is [15] situated slightly below the undersides **18** and **16** of the floor panels **1** and **2**, respectively. In this manner, the entire joint will rest on the strip **6**, and all vertical downwardly-directed forces will be efficiently transmitted to the subfloor **12** without any stresses being exerted on the joint edges **3**, **4**. [20] Thanks to the provision of the equalising grooves **40**, **42**, an entirely even joint will be achieved on the top side, despite the thickness tolerances of the panels **1**, **2**, without having to perform any grinding or the like across the whole panels.

Especially, this obviates the risk of damage to the bottom [25] layer of the compact laminate, which might give rise to bulging of the panels.

Reference is now made to the embodiment of FIGS. **2***a-c* showing in a succession substantially the same laying method as in FIGS. **1***a* and **1***b*. The embodiment of FIGS. [30] **2***a-c* primarily differs from the embodiment of FIGS. **1***a* and **1***b* in that the strip **6** is mounted on the strip panel **1** by means of a mechanical connection instead of glue. To provide this mechanical connection, illustrated in more detail in FIG. **6**, a groove **30** is provided in the underside **18** of the strip panel [35] **1** at a distance from the recess **24**. The groove may be formed either as a continuous groove extending throughout the entire length of the panel **1**, or as a number of separate grooves. The groove defines, together with the recess **24**, a dovetail gripping edge, the underside of which exhibits [40] an exact equalising distance E to the top side **21** of the strip panel **1**. The aluminum strip 6 has a number of punched and bent tongues **54**, as well as one or more lips **56** which are bent round opposite sides of the gripping edge **52** in clamping engagement therewith. This connection is shown in [45] detail from below in the perspective view of FIG. **6**.

Alternatively, a mechanical connection between the strip **6** and the strip panel **1** can be provided as illustrated in FIG. **7** showing in section a cut-away part of the strip panel **1** turned upside down. In FIG. **7**, the mechanical connection [50] comprises a dovetail recess **53** in the underside **18** of the strip panel **1**, as well as tongues/lips **60** punched and bent from the strip **6** and clamping against opposing inner sides of the recess **58**.

The embodiment of FIGS. **2***a-c* is further characterised in [55] that the locking element **8** of the strip **6** is designed as a component bent from the aluminum sheet and having an operative locking surface **10** extending at right angles up from the front side **22** of the strip **6** through a height of e.g. 0.5

mm and a rounded guide surface **34** facilitating the [60] insertion of the locking element **8** into the locking groove when angling down the groove panel **2** towards the subfloor **12** (FIG. **2***b*), as well as a portion **36** which is inclined towards the subfloor **12** and which is not operative in the laying method illustrated in FIGS. **2***a-c*. [65]

Further, it can be seen from FIGS. **2***a-c* that the joint edge **3** of the strip panel **1** has a lower bevel **70** which cooperates

[9]

during laying with a corresponding upper bevel **72** of the joint edge **4** of the groove panel **2**, such that the panels **1** and **2** are forced to move vertically towards each other when their joint edges **3**, **4** are moved up to each other and the panels are pressed together horizontally. [5]

Preferably, the locking surface **10** is so located relative to the joint edge **3** that when the groove panel **2**, starting from the joined position in FIG. **2***c*, is pressed horizontally in the direction D2 against the strip panel **1** and is turned angularly up from the strip **6**, the maximum distance between the axis [10] of rotation A of the groove panel **2** and the locking surface **10** of the locking groove is such that the locking element **8** can leave the locking groove **14** without coming into contact with it.

FIGS. **3***a-b* show another joining method for mechanically [15] joining together the floor panels of FIGS. **2***a-c*. The method illustrated in FIGS. **3***a-c* relies on the fact that the strip **6** is resilient and is especially useful for joining together the short sides of floor panels which have already been joined along one long side as illustrated in FIGS. **2***a-c*. The [20] method of FIGS. **3***a-c* is performed by first placing the two panels **1** and **2** flat on the subfloor **12** and then moving them horizontally towards each other according to FIG. **3***b*. The inclined portion **36** of the locking element **6** then serves as a

guide surface which guides the joint edge **4** of the groove [25] panel **2** up on to the upper side **22** of the strip **6**. The strip **6** will then be urged downwards while the locking element **8** is sliding on the equalising surface **42**. When the joint edges **3**, **4** have been brought into complete engagement with each other horizontally, the locking element **8** will snap [30] into the locking groove **14** (FIG. 3*c*), thereby providing the same locking as in FIG. 2*c*. The same locking method can also be used by placing, in the initial position, the joint edge **4** of the groove panel with the equalising groove **42** on the locking element **10** (FIG. 3*a*). The inclined portion **36** of the [35] locking element **10** then is not operative. This technique thus makes it possible to lock the floor panels mechanically in all directions, and by repeating the laying operations the whole floor can be laid without using any glue.

The invention is not restricted to the preferred embodiments [40] described above and illustrated in the drawings, but several variants and modifications thereof are conceivable within the scope of the appended claims. The strip **6** can be divided into small sections covering the major part of the joint length. Further, the thickness of the strip **6** may vary [45] throughout its width. All strips, locking grooves, locking elements and recesses are so dimensioned as to enable laying the floor panels with flat top sides in a manner to rest on the strip **6** in the joint. If the floor panels consist of compact laminate and if silicone or any other sealing [50] compound, a rubber strip or any other sealing device is applied prior to laying between the fiat projecting part of the strip **6** and the groove panel **2** and/or in the recess **26**, a moisture-proof floor is obtained.

As appears from FIG. **6**, an underlay **46**, e.g. of floor [55] board, foam or felt, can be mounted on the underside of the, panels during the manufacture thereof. In one embodiment, the underlay **46** covers the strip **6** up to the locking element **8**,

such that the joint between the underlay **46** becomes offset in relation to the joint between the joint edges **3** and **4**. [60]

In the embodiment of FIG. **5**, the strip **6** and its locking element **8** are integrally formed with the strip panel **1**, the projecting part of the strip **6** thus forming an extension of the lower part of the joint edge **3**. The locking function is the [65] same as in the embodiments described above. On the underside **18** of the strip panel **1**, there is provided a separate strip,

[10]

band or the like **74** extending throughout the entire length of the joint and having, in this embodiment, a width coveting approximately the same surface as the separate strip **6** of the previous embodiments. The strip **74** can be provided directly on the rear side **18** or in a recess formed therein (not shown), [5] so that the distance from the front side **21**, **26** of the floor to the rear side **76**, including the thickness of the strip **74**, always is at least equal to the corresponding distance in the panel having the greatest thickness tolerance. The panels **1**, **2** will then rest, in the joint, on the strip **74** or only on the [10] undersides **18**, **16** of the panels, if these sides are made plane.

When using a material which does not permit downward bending of the strip **6** or the locking element **8**, laying can be performed in the way shown in FIG. **5**. A floor panel **2*a*** [15] is moved angled upwardly with its long side **4*a*** into engagement with the long side **3** of a previously laid floor panel **1** while at the same time a third floor panel **2*b*** is moved with its short side **4*b*'** into engagement with the short side **3*a*'** of the upwardly-angled floor panel **2*a*** and is fastened by [20] angling the panel **2*b*** downwards. The panel **2*b*** is then pushed along the short side **3*a*'** of the upwardly-angled floor panel **2*a*** until its long side **4*b*** encounters the long side **3** of the initially-laid panel **1**. The two upwardly-angled panels **2*a*** and

2*b* are therefore angled down on to the subfloor **12** [25] so as to bring about locking.

By a reverse procedure the panels can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again.

Several variants of preferred laying methods are conceivable. [30] For example, the strip panel can be inserted under the groove panel, thus enabling the laying of panels in all four directions with respect to the initial position.

I claim:

1. A method for laying and mechanically joining rectangular [35] building panels in parallel rows, the method comprising the steps of:

(a) providing a plurality of rectangular building panels having long edges and short edges,

said panels being provided with first locking means for [40] mechanically locking together their long edges and their short edges in a first direction at right angles to a principal plane of the panels,

the panels further including second locking means including: [45]

a locking strip at a first long edge and at a first short edge at a bottom side of each of the panels, and

a locking groove at a second long edge of each of the panels, opposite the first long edge, and a locking groove at a second short edge of each of the [50] panels, opposite the first short edge,

each of the locking grooves extending parallel to and spaced from the corresponding second edge and being open at the bottom side of the panel,

and each locking strip being integrated with the [55] panel and extending throughout substantially an entire length of the corresponding first edge,

a locking element projecting from each of the locking strips, such that when two adjacent panels

have been mechanically joined together along [60]adjacent edges thereof, one of the locking strips of one of the panels extends under the bottom side of an adjacent one of the panels with the locking element of said strip being received in the locking groove of the adjacent one of the panels, thereby [65] mechanically connecting the one panel and the adjacent one panel to each other in a second

[11]

direction parallel to said principal plane and at right angles to the joined edges;

(b) placing a new one of the panels adjacent to a long edge of a previously laid first one of [5] the panels in a first row and to a short edge of a previously laid second one of the panels in an adjacent second row, such that the new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position [10] relative to said second panel and such that the long edge of the new panel provided with a locking groove is placed upon and in contact with a locking strip at the adjacent long edge of the first panel;

(c) subsequently angling down the new one of the panels [15] so as to accommodate the locking element of the strip of the first panel in the locking groove of the new panel, whereby the new panel and the first panel are mechanically connected with each other in the second direction with respect to the thus connected long edges, wherein [20] the long edges, in the angled down position of the new panel, are in engagement

with each other and thereby mechanically locked together in the first direction also; and

(d) displacing the new one of the panels in its longitudinal direction relative to the first panel towards a final [25] longitudinal position wherein the locking element of one of the short edges of the new one of the panels and the second panel snaps up into the locking groove of the other one of the short edges, whereby the new one of the panels and the second panel are mechanically [30] connected with each other in both in the first direction and in the second direction with respect to the thus-connected short edges.

2. The method as claimed in claim **1**, wherein the displacing step includes bending the locking strip located at the [35] short edges to be locked together downwards as a result of displacing the new panel, until the locking element snaps up into the locking groove.

3. The method as claimed in claim **1**, wherein the displacing step includes engaging the locking groove of the [40] short edge of the new panel to be locked to the short edge of the second panel with the locking element of the short edge of the second panel.

4. The method as claimed in claim **3**, wherein the angling step includes angling the new panel down into a position [45] where the end portion of the new panel facing the second panel is placed upon and in contact with the locking strip at the short edge of the second panel.

5. The method as claimed in claim **1**, wherein the displacing step includes engaging the locking element of the [50] short edge of the new one of the panels to be locked to the short edge of the second panel with the locking groove of the short edge of the second panel.

6. The method as claimed in claim **1**, further comprising the step of taking up the new one of the panels, after having

[55] been laid and mechanically joined to the first and to the second panel, by angling the new one of the panels and the second panel together in relation to the first panel and subsequently loosening the new one of the panels from the second panel by angling and/or displacing the new one of the [60] panels in relation to the second panel.

7. The method as claimed in claim **1**, wherein the providing step includes providing panels wherein the strips are made of a material different from that of the panels and are fixedly mounted on the panels at the factory. [65]

8. The method as claimed in claim **1**, wherein the providing step includes providing panels wherein the strips are

[12]

integrally formed with the panels, i.e., made in one piece with the panels.

9. The method as claimed in claim **1**, wherein the method includes making a floor from the building panels.

10. A method for laying and mechanically joining rectangular [5] building panels in parallel rows, the method comprising the steps of:

(a) providing a plurality of rectangular building panels having long edges and short edges,

said panels being provided with first locking means for [10] mechanically locking together their long edges and their short edges in a first direction at right angles to a principal plane of the panels,

the panels further including second locking means including: [15]

a locking strip at a first long edge and at a first short edge at a bottom side of each of the panels, and

a locking groove at a second long edge of each of the panels, opposite the first long edge, and a locking

groove at a second short edge of each of the [20] panels, opposite the first short edge,

each of the locking grooves extending parallel to and spaced from the corresponding second edge and being open at the bottom side of the panel,

and each locking strip being integrated with the [25] panel and extending throughout substantially an entire length of the corresponding first edge,

a locking element projecting from each of the locking strips, such that when two adjacent panels have been mechanically joined together along [30] adjacent edges thereof, one of the locking strips of one of the panels extends under the bottom side of an adjacent one of the panels with the locking element of said strip being received in the locking groove of the adjacent one of the panels, thereby [35] mechanically connecting the one panel and the adjacent one panel to each other in a second direction parallel to said principal plane and at right angles to the joined edges;

(b) placing a new one of the panels adjacent to a long edge [40] of a previously laid first one of the panels in a first row and to a short edge of a previously laid second one of the panels in an adjacent second row, such that the new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal [45] plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position relative to the second panel and such that a locking strip provided at a long edge of the new one of the panels is inserted under the adjacent long edge of the first panel [50] being provided with a locking groove;

(c) subsequently angling down the new one of the panels so as to accommodate the locking element of the strip of the new one of the panels in the locking

groove of the first panel, whereby the new one of the panels and [55] the first panel are mechanically connected with each other in the second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new one of the panels, are in engagement with each other and thereby mechanically [60] locked together in the first direction also; and

(d) displacing the new one of the panels in its longitudinal direction relative to the first panel towards the final position until the locking element of one of the short edges of the new one of the panels and the second panel [65] snaps up into the locking groove of the other one of the short edges, whereby the new one of the panels and the

[13]

second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected short edges.

11. The method as claimed in claim **10**, wherein the [5] displacing step includes bending the locking strip located at the short edges to be locked together downwards as a result of displacing the new one of the panels, until the locking element snaps up into the locking groove.

12. The method as claimed in claim **10**, wherein the [10] displacing step includes engaging the locking groove of the short edge of the new one of the panels to be locked to the short edge of the second panel with the locking element of the short edge of the second panel.

13. The method as claimed in claim **12**, wherein the [15] angling step includes angling the new panel down into a position where the end portion of the new one of the panels

facing the second panel is placed upon and in contact with the locking strip at the short edge of the second panel.

14. The method as claimed in claim **10**, wherein the [20] displacing step includes engaging the locking element of the short edge of the new one of the panels to be locked to the short edge of the second panel with the locking groove of the short edge of the second panel.

15. The method as claimed in claim **10**, further comprising [25] the step of taking up the new one of the panels, after having been laid and mechanically joined to the first and to the second panel, by angling the new one of the panels and the second panel together in relation to the first panel and subsequently loosening the new one of the panels from the [30] second panel by angling and/or displacing the new one of the panels in relation to the second panel.

16. The method as claimed in claim **10**, wherein the poviding step includes providing panels wherein the strips are made of a material different from that of the panels and [35] are fixedly mounted on the panels at the factory.

17. The method as claimed in claim **10**, wherein the providing step includes providing panels wherein the strips are integrally formed with the panels, i.e., made in one piece with the panels. [40]

18. The method as claimed in claim **10**, wherein the method includes making a floor from the building panels.

19. A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising the steps of: [45]

(a) placing a new one of the panels adjacent to a long edge of a previously laid first one of the panels in a first row and to a short edge of a previously laid second one of the panels in an adjacent second row, such that the [50] new one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first

panel, such that the new one of the panels is spaced from its final longitudinal position relative to said second panel and such that a long edge of the new panel is provided with a locking groove [55] which is placed upon and in contact with a locking strip at the adjacent long edge of the first panel;

(b) subsequently angling down the new one of the panels so as to accommodate a locking element of the strip of the first panel in the locking groove of the new panel, [60]whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected long edges, wherein the long edges, in the angled down position of the new panel, are in engagement with each other and thereby [65] mechanically locked together in a first direction also; and

[14]

(c) displacing the new one of the panels in its longitudinal direction relative to the first panel towards a final longitudinal position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of the [5] other one of the short edges, whereby the new one of the panels and the second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected short edges. [10]

20. The method as claimed in claim **19**, wherein the displacing step includes bending downwards the locking strip located at the end portion to be locked together as a result of displacing the new panel, until the locking element snaps up into the locking groove. [15]

21. The method as claimed in claim **19**, wherein the angling step includes angling the new panel down into a position where the short edge of the another set of edges of the new panel is placed upon and in contact with the locking strip at the short edge of the second panel. [20]

22. The method as claimed in claim **19**, further comprising the step of taking up the new panel, after having been laid and mechanically joined to the first and to the second panel, by angling the new panel and the second panel together in relation to the first panel and subsequently [25] loosening the new panel from the second panel by angling and/or displacing the new panel in relation to the second panel.

23. A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising [30] the steps of:

(a) placing a new one of the panels adjacent to a long edge of a previously laid first one of the panels in a first row and to a short edge of a previously laid second one of the panels in an adjacent second row, such that the new [35] one of the panels is in the second row, while holding the new one of the panels at an angle relative to a principal plane of the first panel, such that the new one of the panels is spaced from its final longitudinal position relative to the second panel and such that a first locking [40] element provided at a long edge of the new one of the panels is inserted under the adjacent long edge of the first panel being provided with a second locking element;

(b) subsequently angling down the new one of the panels [45] so as to accommodate the locking element of the new one of the panels in the locking element of the first panel, whereby the new one of the panels and the first panel are mechanically connected with each other in a second direction with respect to the thus

connected [50] long edges, wherein the long edges, in the angled down position of the new one of the panels, are in engagement with each other and thereby mechanically locked together in a first direction also; and

(c) displacing the new one of the panels in its longitudinal [55] direction relative to the first panel towards the final position until a locking element of one of the short edges of the new one of the panels and the second panel snaps up into a locking groove of the other one of the short edges, whereby the new one of the panels and the [60] second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected short edges.

24. The method as claimed in claim **23**, wherein the [65] displacing step includes bending downwards the locking strip located at the end portion to be locked together as a

[15]

result of displacing the new panel, until the locking element snaps up into the locking groove.

25. The method as claimed in claim **23**, wherein the angling step includes angling the new panel down into a position where the short edge of the another set of edges of [5] the new panel is placed upon and in contact with the locking strip at the short edge of the second panel.

26. The method as claimed in claim **23**, further comprising the step of taking up the new panel, after having been laid and mechanically joined to the first and to the second panel, by angling the new panel and the second panel [10] together in relation to the first panel and subsequently loosening the new panel from the second panel by angling

and/or displacing the new panel in relation to the second panel.

27. A method for laying and mechanically joining rectangular [15] building panels in parallel rows, the method comprising the steps of:

(a) providing a plurality of rectangular building panels having one set of edges and another set of edges,

said panels being provided with first locking means for [20] mechanically locking together their one set of edges and their another set of edges in a first direction at right angles to a principal plane of the panels,

the panels further including second locking means including: [25]

a locking strip at a first edge of the one set of edges and at a first edge of the another set of edges at a bottom side of each of the panels, and

a locking groove at a second edge of the one set of edges of each of the panels, opposite the first edge [30]of the one set of edges, and a locking groove at a second edge of the another set of edges of each of the panels, opposite the first edge of the another set of edges,

each of the locking grooves extending parallel to and [35] spaced from the corresponding second edge and being open at the bottom side of the panel,

and each locking strip being integrated with the panel and extending throughout substantially an entire length of the corresponding first edge, [40]

a locking element projecting from each of the locking strips, such that when two adjacent panels have been mechanically joined together along adjacent edges thereof, one of the locking strips of one of the panels extends under the bottom side of [45] an

adjacent one of the panels with the locking element of said strip being received in the locking groove of the adjacent one of the panels, thereby mechanically connecting the one panel and the adjacent one panel to each other in a second [50] direction parallel to said principal plane and at right angles to the joined edges;

(b) placing a new one of the panels adjacent to one edge of the one set of edges of a previously laid first one of the panels in a first row and to one edge of the another [55] set of edges of a previously laid second one of the panels in an adjacent second row, while holding the new panel at an angle relative to a principal plane of the first panel, such that the new panel is spaced from its final position relative to said second panel in a direction [60] parallel to said principal plane and such that the second edge of the one set of edges of the new panel provided with a locking groove is placed upon and in contact with a locking strip at the adjacent first edge of the one set of edges of the first panel; [65]

(c) subsequently angling down the new panel so as to accommodate the locking element of the strip of the

first panel in the locking groove of the new panel, whereby the new panel and the first panel are mechanically connected with each other in the second direction with respect to the thus connected edges [5] of the new panel and the first panel, wherein the connected edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked together in the first direction also; and

(d) displacing the new panel relative to the first panel in a direction parallel with the connected edges of the new [10] panel and the first panel towards a final position wherein the locking element of one of the another set of edges of the new panel and the second panel snaps up into the locking groove of the other one of the another set of edges, whereby the new panel and the [15] second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus-connected edges of the new panel and the second panel.

28. The method as claimed in claim **27**, wherein the [20] displacing step includes bending the locking strip located at the another set of edges to be locked together downwards as a result of displacing the new panel, until the locking element snaps up into the locking groove.

29. The method as claimed in claim **27**, wherein the [25] angling step includes angling the new panel down into a position where the second edge of the another set of edges of the new panel is placed upon and in contact with the locking strip at the first edge of the another set of edges of the second panel. [30]

30. The method as claimed in claim **27**, further comprising the step of taking up the new panel, after having been laid and mechanically joined to the first and to the second panel, by angling the new panel and the second panel together in relation to the first panel and subsequently [35] loosening the new panel from the second panel by angling and/or displacing the new panel in relation to the second panel.

31. A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising [40] the steps of:

(a) providing a plurality of rectangular building panels having one set of edges and another set of edges, said panels being provided with first locking means for mechanically locking together their one set of edges [45] and their another set of edges in a first direction at right angles to a principal plane of the panels,

the panels further including second locking means including: a locking strip at a first edge of the one set of edges and at a [50] first edge of the another set of edges at a bottom side of each of the panels, and

a locking groove at a second edge of the one set of edges of each of the panels, opposite the first edge of the one set of edges, and a locking groove at a [55] second edge of the another set of edges of each of the panels, opposite the first edge of the another set of edges,

each of the locking grooves extending parallel to and spaced from the corresponding second edge and [60] being open at the bottom side of the panel,

and each locking strip being integrated with the panel and extending throughout substantially an entire length of the corresponding first edge,

a locking element projecting from each of the locking [65] strips, such that when two adjacent panels have been mechanically joined together along

adjacent edges thereof, one of the locking strips of one of the panels extends under the bottom side of an adjacent one of the panels with the locking element of said strip being received in the locking groove of the adjacent one of the panels, thereby [5] mechanically connecting the one panel and the adjacent one panel to

each other in a second direction parallel to said principal plane and at right angles to the joined edges;

(b) placing a new one of the panels adjacent to one edge [10] of the one set of edges of a previously laid first one of the panels in a first row and to one edge of the another set of edges of a previously laid second one of the panels in an adjacent second row, while holding the new panel at an angle relative to a principal plane of the [15] first panel, such that the new panel is spaced from its final position relative to the second panel in a direction parallel to the principal plane and such that a locking strip provided at one edge of the one set of edges of the new panel is inserted under the adjacent edge of the one [20] set of edges of the first panel being provided with a locking groove;

(c) subsequently angling down the new panel so as to accommodate the locking element of the strip of the new panel in the locking groove of the first panel, [25] whereby the new panel and the first panel are mechanically connected with each other in the second direction with respect to the thus connected edges of the new panel and the first panel, wherein the connected edges, in the angled down position of the new panel, are in [30] engagement with each other and thereby mechanically locked together in the first direction also; and

(d) displacing the new panel relative to the first panel in a direction parallel with said connected edges of the new panel and the first panel towards the final position [35] until the locking element of one of the another set of edges of the new panel and the another set of edges of the second panel snaps up into the locking groove of the other one of the another set of edges, whereby the new panel and the second panel

are mechanically connected [40] with each other in both the first direction and in the second direction with respect to the thus connected edges of the new panel and the second panel.

32. The method as claimed in claim **31**, wherein the displacing step includes bending the locking strip located at [45] the another set of edges to be locked together downwards as a result of displacing the new panel, until the locking element snaps up into the locking groove.

33. The method as claimed in claim **31**, wherein the angling step includes angling the new panel down into a [50] position where the second edge of the another set of edges of the new panel is placed upon and in contact with the locking strip at the first edge of the another set of edges of the second panel.

34. The method as claimed in claim **31**, further comprising [55] the step of taking up the new panel, after having been laid and mechanically joined to the first and to the second panel, by angling the new panel and the second panel together in relation to the first panel and subsequently loosening the new panel from the second panel by angling [60] and/or displacing the new panel in relation to the second panel.

35. A method for laying and mechanically joining rectangular building panels in parallel rows, the method comprising the steps of: [65]

(a) placing a new one of the panels adjacent to one edge of a previously laid first one of the panels in a first row

[18]

and to another edge of a previously laid second one of the panels in an adjacent second row, while holding the new panel at an angle relative to a principal plane

of the first panel, such that the new panel is spaced from its final position relative to said second panel in a direction [5] parallel to said principal plane and such that one edge of the new panel which is provided with a locking groove is placed upon and in contact with a locking strip at the adjacent one edge of the first panel;

(b) subsequently angling down the new panel so as to [10] accommodate a locking element of the locking strip of the first panel in the locking groove of the new panel, whereby the new panel and the first panel are mechanically connected with each other in a second direction with respect to the thus connected edges of the new [15] panel and the first panel, wherein the connected edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically tocked together in a first direction that is at right angles to the principal plane of the first panel also; and [20]

(c) displacing the new panel relative to the first panel in a direction parallel with said connected edges of the new panel and the first panel towards a final position until a locking element of one of an another edge of the new panel and the another edge of the second panel [25] snaps up into a locking groove of the other one of the another edges, whereby the new panel and the second panel are mechanically connected with each other in both in the first direction and in the second direction with respect to the thus connected set of another edges. [30]

36. The method as claimed in claim **35**, wherein the displacing step includes bending downwards the locking strip located at the another edges to be locked together as a result of displacing the new panel, until the locking element snaps up into the locking groove. [35]

37. The method as claimed in claim **35**, wherein the angling step includes angling the new panel down into a position where the second edge of the another set of edges of the new panel is placed upon and in contact with the locking strip at the first edge of the another set of edges of [40] the second panel.

38. The method as claimed in claim **35**, further comprising the step of taking up the new panel, after having been laid and mechanically joined to the first and to the second panel, by angling the new panel and the second panel [45] together in relation to the first panel and subsequently loosening the new panel from the second panel by angling and/or displacing the new panel in relation to the second panel.

39. A method for laying and mechanically joining rectangular [50] building panels in parallel rows, the method comprising the steps of:

(a) placing a new one of the panels adjacent to one edge of a previously laid first one of the panels in a first row and to another edge of a previously laid second one of [55] the panels in an adjacent second row, while holding the new panel at an angle relative to a principal plane of the first panel, such that the new panel is spaced from its final position relative to the second panel in a direction parallel to said principal plane and such that a first [60] locking member provided at one edge of the new panel is inserted under the adjacent one edge of the first panel being provided with a second locking member;

(b) subsequently angling down the new panel so as to engage the first locking member of the new panel with [65] the second locking member of the first panel, whereby the new panel and the first panel are mechanically

[19]

connected with each other in a second direction with respect to the thus connected edges of the new panel and the first panel, wherein the connected edges, in the angled down position of the new panel, are in engagement with each other and thereby mechanically locked [5] together in a first direction that is at right angles to the principal plane of the first panel also; and

(c) displacing the new panel relative to the first panel in a direction parallel with the connected edges of the new panel and the first panel towards a final position until a [10] locking element of one of an another edge of the new panel and the another edge of the second panel snaps up into a locking groove of the other one of the another edges, whereby the new panel and the second panel are mechanically connected with each other in both in the [15] first direction and in the second direction with respect to the thus connected edges of the new panel and the second panel.

40. The method as claimed in claim **39**, wherein the displacing step includes bending downwards the locking

[2O]

strip located at the another edges to be locked together as a result of displacing the new panel, until the locking element snaps up into the locking groove.

41. The method as claimed in claim **39**, wherein the angling step includes angling the new panel down into a [5] position where the second edge of the another set of edges of the new panel is placed upon and in contact with the locking strip at the first edge of the another set of edges of the second panel.

42. The method as claimed in claim **39**, further comprising [10] the step of taking up the new panel, after having been laid and mechanically joined to the first and to the second panel, by angling the new panel and the second panel together in relation to the first panel and subsequently loosening the new panel from the second panel by angling [15] and/or displacing the new panel in relation to the second panel.

* * * * *

APPENDIX G

UNITED STATES PATENT

Patent No. 6,182,410

See Fold Out Exhibit
Diagrams

US006182410B1

(12) **United States Patent**
Pervan

(10) **Patent No.: US 6,182,410 B1**
(45) **Date of Patent: *Feb. 6, 2001**

(54) **SYSTEM FOR JOINING BUILDING BOARDS**

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(73) Assignee: **Välinge Aluminium AB**, Viken (SE)

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **09/356,563**

(22) Filed: **Jul. 19, 1999**

Related U.S. Application Data

(62) Continuation of application No. 09/193,687, filed on Nov. 18, 1999, now Pat. No. 6,023,907, which is a continuation of application No. 09/003,499, filed on Jan. 6, 1998, now Pat. No. 5,860,267, which is a division of application No. 08/436,244, filed as application No. PCT/SE94/00386 on Apr. 29, 1994, now abandoned.

(30) **Foreign Application Priority Data**

May 10, 1993 (SE) 9301595-6

(51) **Int. Cl.**[7] **E04F 15/22**

(52) **U.S. Cl.** **52/403.1**; 52/480; 52/506.1; 52/506.05; 52/582.1; 52/592.2; 52/551

(58) **Field of Search** 52/403.1, 480, 52/506.05, 551, 591.3, 592.2, 582.1, 578, 506.09, 506.1

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Assistant Examiner—Yvonne M. Horton
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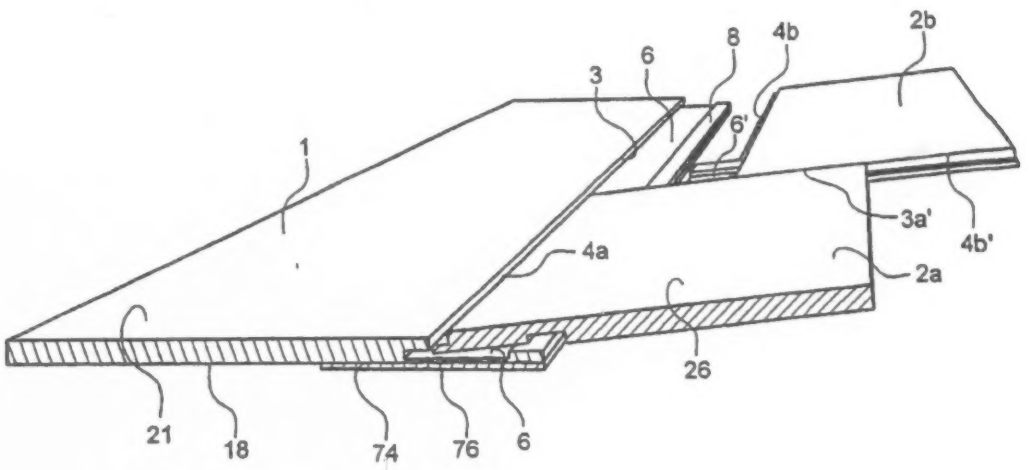
(57) **ABSTRACT**

An edge lock is provided for use in a flooring system having a plurality of floor panels. The edge lock mechanically and releasably locks together adjacent edges of pairs of adjacent floor panels during assembly of the flooring system, and when said adjacent floor panels are laying flat on a subfloor with upper corner portions of said adjacent edges being mutually spaced apart, the edge lock includes a lock for forming a first mechanical connection for locking the adjacent edges to each other in a vertical direction, and for forming a second mechanical connection for locking the adjacent edges to each other in a horizontal direction at right angles to the edges. The lock includes a locking groove extending parallel to and spaced from a first one of the adjacent edges of one of the adjacent floor panels and being open at a rear side of the one adjacent floor panel, and a flexible and resilient locking strip integrated with another of the adjacent floor panels.

61 Claims, 6 Drawing Sheets



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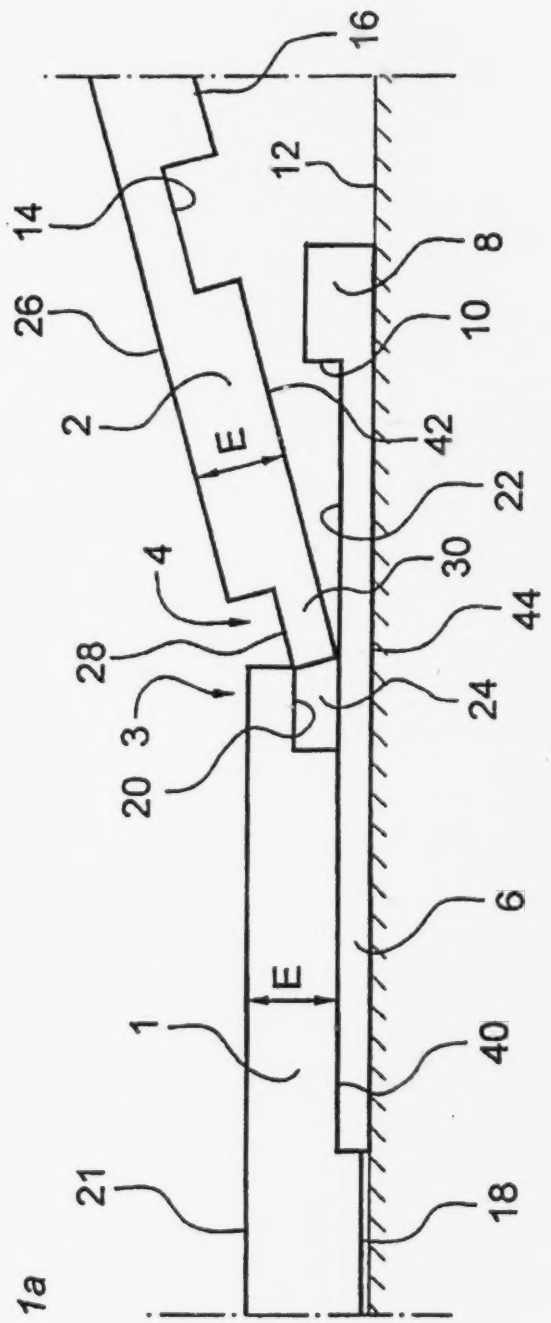
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Fig. 1a

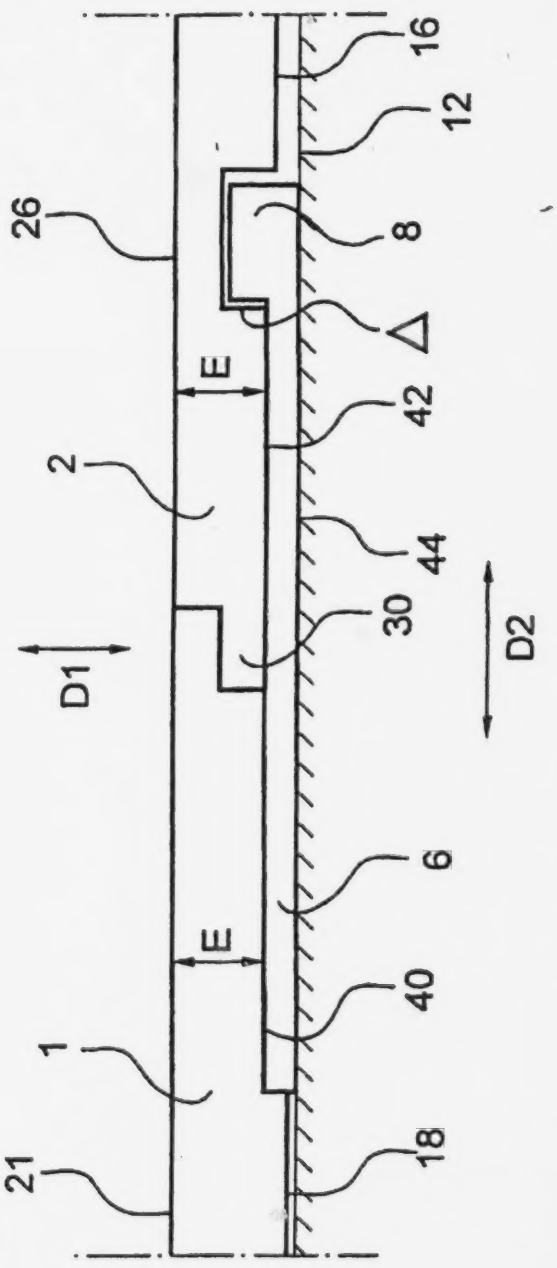
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Fig. 1b

Fig. 2a

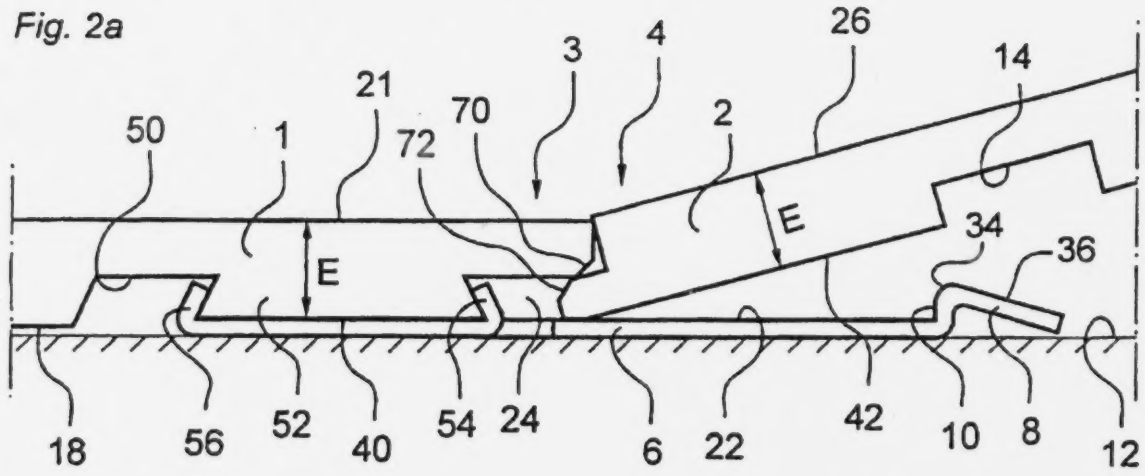


Fig. 2b

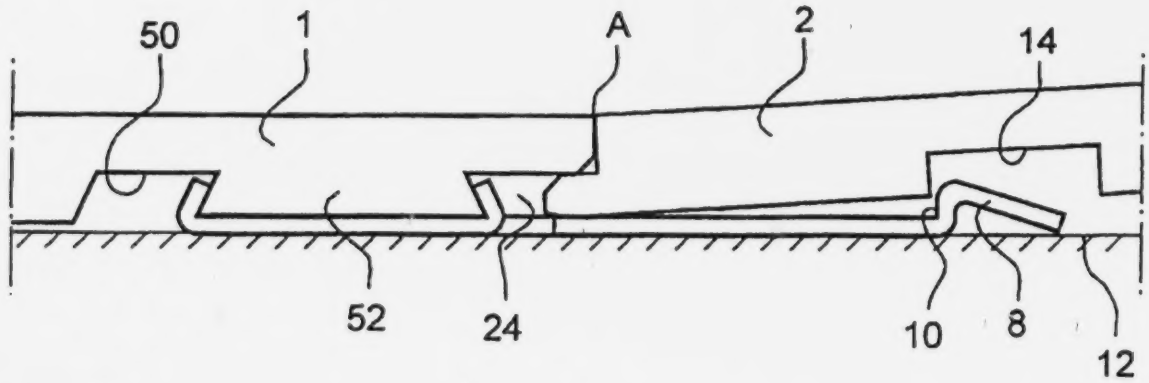


Fig. 2c

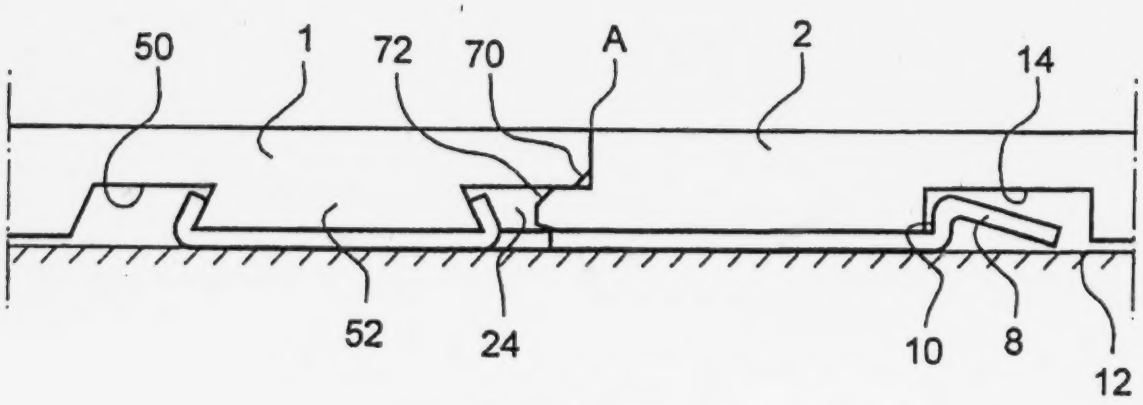


Fig. 3a

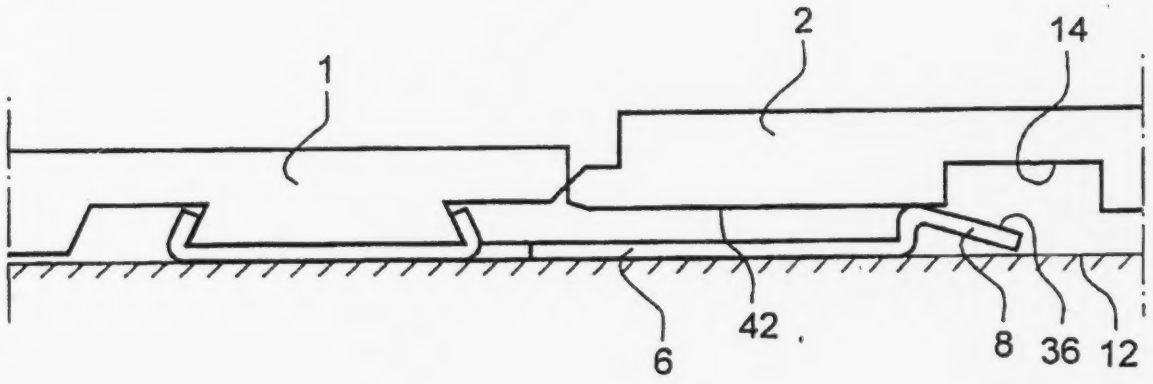


Fig. 3b

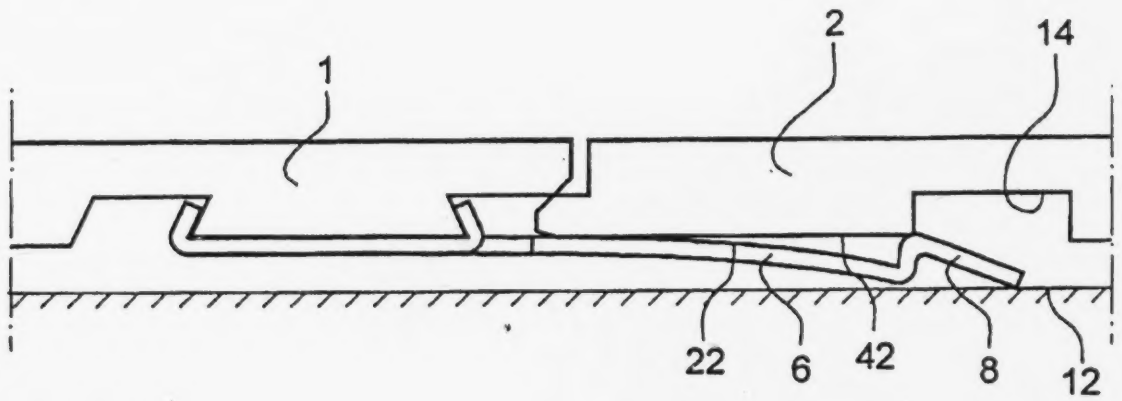


Fig. 3c

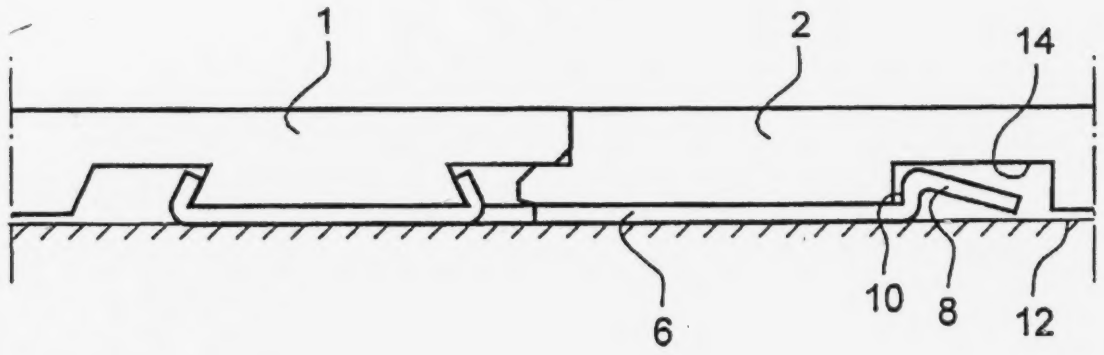


Fig. 4a

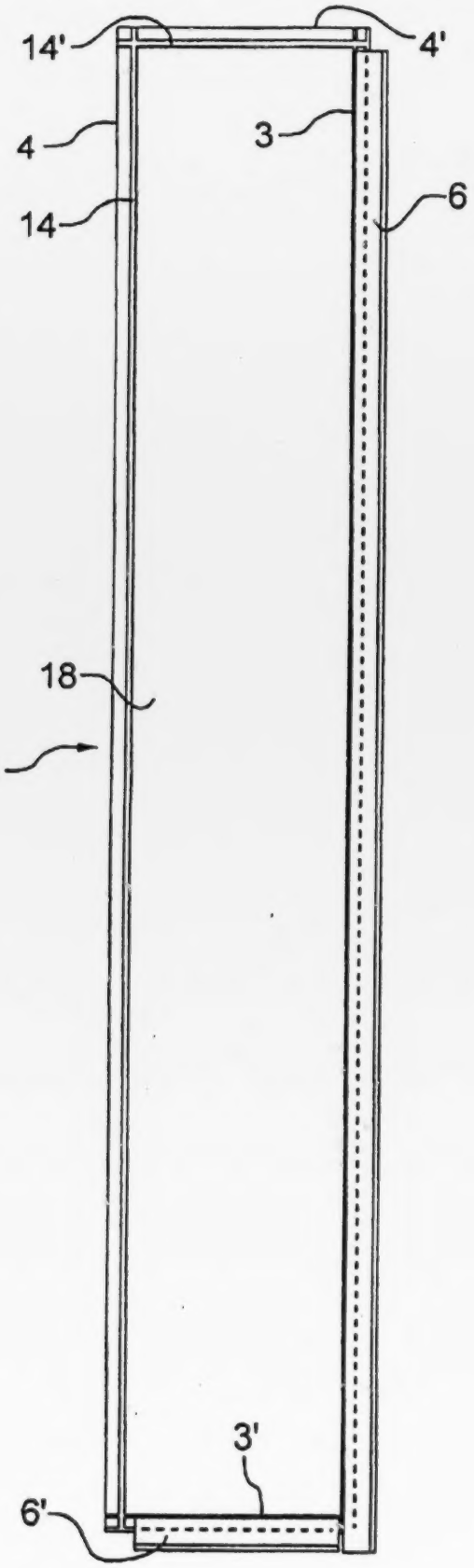
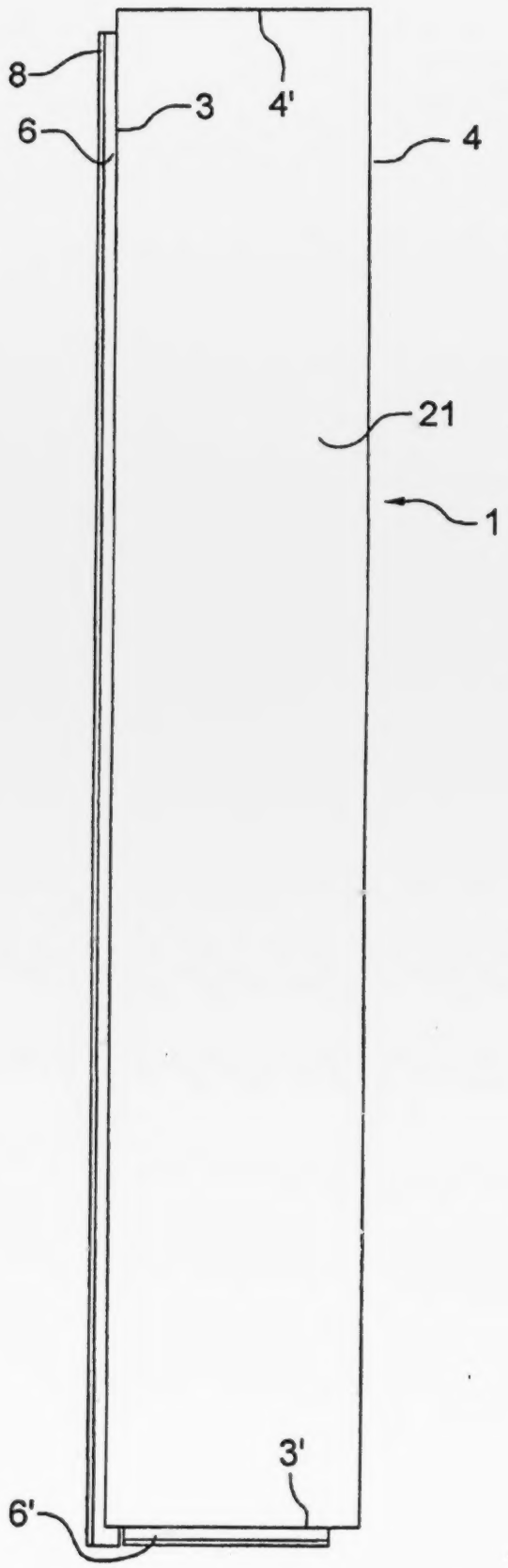


Fig. 4b



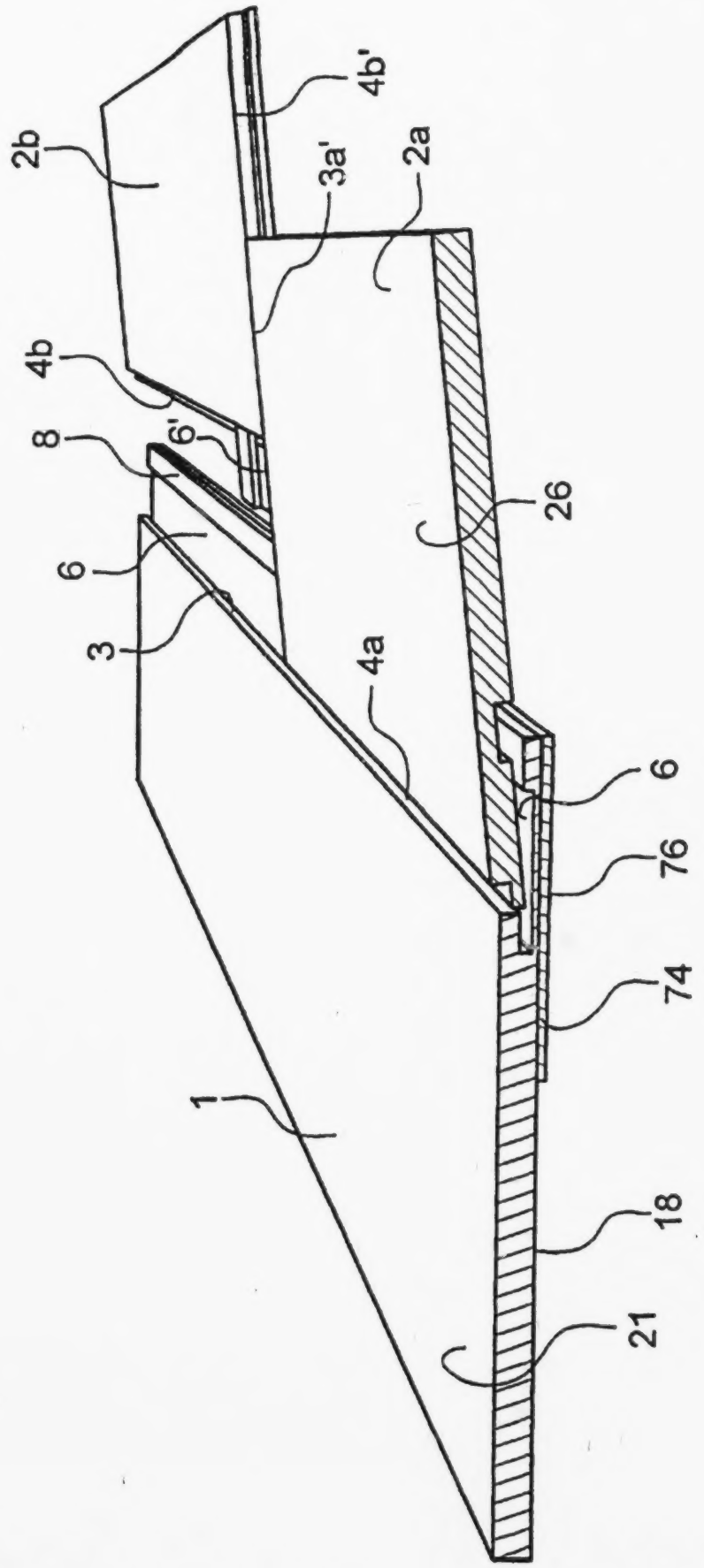


Fig. 5

Fig. 6

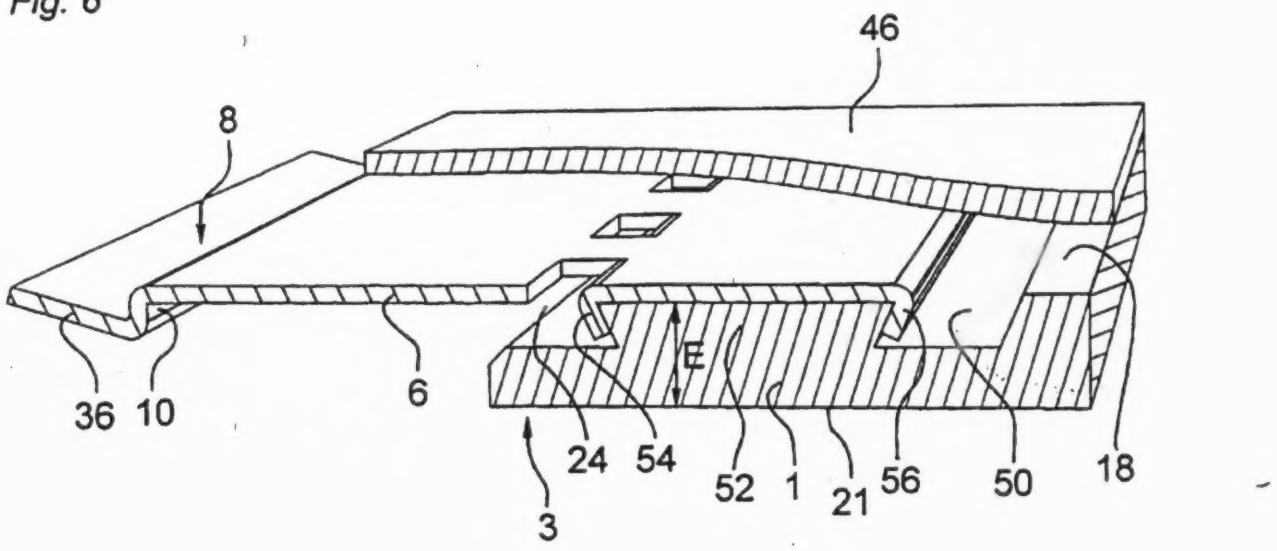
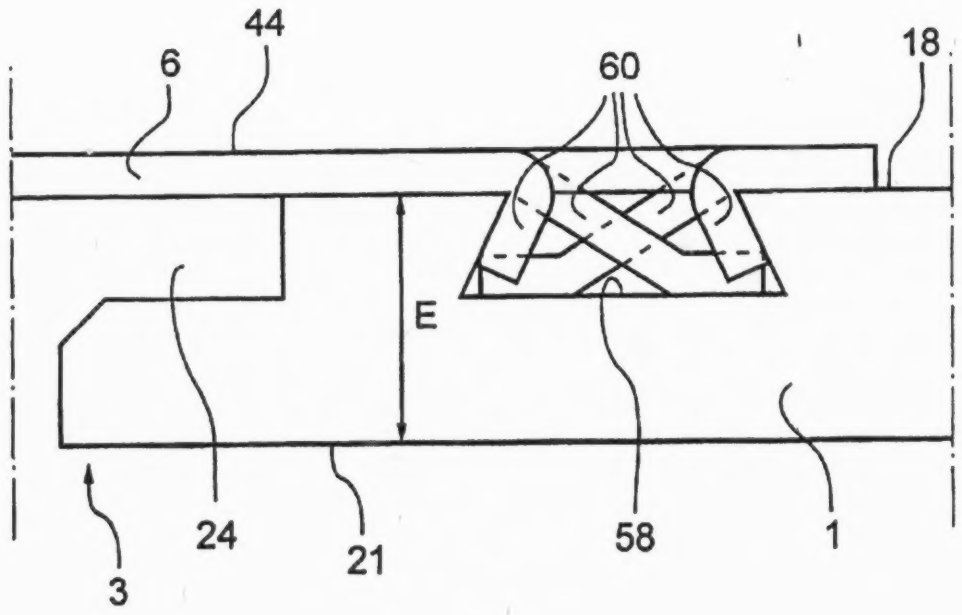


Fig. 7



US 6,182,410 B1

[1]

SYSTEM FOR JOINING BUILDING BOARDS

This application is a continuation of application Ser. No. 09/193,687, filed Nov. 18, 1999 now U.S. Pat. No. 6,023,907, which is a continuation of application Ser. No. 09/003, [5] 499 filed on Jan. 6, 1998 now U.S. Pat. No. 5,860,267 which is a divisional of application Ser. No. 08/436,244 filed on May 17, 1995 now abandoned, which is a 371 of PCT/SE94/00386 filed Apr. 29, 1994.

TECHNICAL FIELD[10]

The invention generally relates to a system for providing a joint along adjacent joint edges of two building panels, especially floor panels.

More specifically, the joint is of the type where the [15] adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, and where a locking device forms a second mechanical connection locking the panels to each other in a second [20] direction parallel to the principal plane and at right angles to the joint edges, the locking device comprising a locking groove which extends parallel to and spaced from the joint edge of one of the panels, and said locking groove being open at the rear side of this one panel. [25]

The invention is especially well suited for use in joining floor panels, especially thin laminated floors. Thus, the following description of the prior art and of the objects and features of the invention will be focused on this field of use. It should however be emphasised that the invention is useful

[30] also for joining ordinary wooden floors as well as other types of building panels such as wall panels and roof slabs.

BACKGROUND OF THE INVENTION

A joint of the aforementioned type is known e.g. from SE [35] 450,141. The first mechanical connection is achieved by means of joint edges having tongues and grooves. The locking device for the second mechanical connection comprises two oblique locking grooves, one in the rear side of each panel, and a plurality of spaced-apart spring clips [40] which are distributed along the joint and the legs of which are pressed into the grooves, and which are biased so as to tightly clamp the floor panels together. Such a joining technique is especially useful for joining thick floor panels to form surfaces of a considerable expanse. [45]

Thin floor panels of a thickness of about 7-10 mm, especially laminated floors, have in a short time taken a substantial share of the market. All thin floor panels employed are laid as "floating floors" without being attached to the supporting structure. As a rule, the dimension of the 50 floor panels is 200x1200 mm, and their long and short sides are formed with tongues and grooves. Traditionally, the floor is assembled by applying glue in the groove and forcing the floor panels together. The tongue is then glued in the groove of the other panel. As a rule, a laminated floor consists of an [55] upper decorative wear layer of laminate having a thickness of about 1 mm, an intermediate core of particle board or other board, and a base layer to balance the construction. The core has essentially poorer properties than the laminate, e.g. in respect of hardness and water resistance, but it is [60] nonetheless needed primarily for providing a groove and tongue for assemblage. This means that the overall thickness must be at least about 7 mm. These known

laminated floors using glued tongue-and-groove joints however suffer from several inconveniences. [65]

First, the requirement of an overall thickness of at least about 7 mm entails an undesirable restraint in connection

[2]

with the laying of the floor, since it is easier to cope with low thresholds when using thin floor panels, and doors must often be adjusted in height to come clear of the floor laid. Moreover, manufacturing costs are directly linked with the [5] consumption of material.

Second, the core must be made of moisture-absorbent material to permit using water-based glues when laying the floor. Therefore, it is not possible to make the floors thinner using so-called compact laminate, because of the absence of [10] suitable gluing methods for such non-moisture-absorbent core materials.

Third, since the laminate layer of the laminated floors is highly wear-resistant, tool wear is a major problem when working the surface in connection with the formation of [15] the tongue.

Fourth, the strength of the joint, based on a glued tongue-and-groove connection, is restricted by the properties of the core and of the glue as well as by the depth and height of the groove. The laying quality is entirely dependent on the [20] gluing. In the event of poor gluing, the joint will open as a result of the tensile stresses which occur e.g. in connection with a change in air humidity.

Fifth, laying a floor with glued tongue-and-groove joints is time-consuming, in that glue must be applied to every [25] panel on both the long and short sides thereof.

Sixth, it is not possible to disassemble a glued floor once laid, without having to break up the joints. Floor panels that have been taken up cannot therefore be used again. This is a

drawback particularly in rental houses where the flat [30]concerned must be put back into the initial state of occupancy. Nor can damaged or worn-out panels be replaced without extensive efforts, which would be particularly desirable on public premises and other areas where parts of the floor are subjected to great wear.

[35]Seventh, known laminated floors are not suited for such use as involves a considerable risk of moisture penetrating down into the moisture-sensitive core.

Eighth, present-day hard, floating floors require, prior to laying the floor panels on hard subfloors, the laying of a [40] separate underlay of floor board, felt, foam or the like, which is to damp impact sounds and to make the floor more pleasant to walk on. The placement of the underlay is a complicated operation, since the underlay must be placed in edge-to-edge fashion. Different underlays affect the proper- [45] ties of the floor.

There is thus a strongly-felt need to overcome the above-mentioned drawbacks of the prior art. It is however not possible simply to use the known joining technique with glued tongues and grooves for very thin floors, e.g. with [50] floor thicknesses of about 3 mm, since a joint based on a tongue-and-groove connection would not be sufficiently strong and practically impossible to produce for such thin floors. Nor are any other known joining techniques usable for such thin floors. Another reason why the making of thin [55] floors from e.g. compact laminate involves problems is the thickness tolerances of the panels, being about 0.2-0.3 mm for a panel thickness of about 3 mm. A 3-mm compact laminate panel having such a thickness tolerance would have, in ground to uniform thickness on its rear side, an [60] unsymmetrical design, entailing the risk of bulging. Moreover, if the panels have different thicknesses, this also means that the joint will be subjected to excessive load.

Nor is it possible to overcome the above-mentioned problems by using double-adhesive tape or the like on the [65] undersides of the panels, since such a connection catches directly and does not allow for subsequent adjustment of the panels as is the case with ordinary gluing.

[3]

Using U-shaped clips of the type disclosed in the above-mentioned SE 450,141, or similar techniques to overcome the drawbacks discussed above is no viable alternative either. Especially, biased clips of this type cannot be used for joining panels of such a small thickness as 3 mm. Normally, [5] it is not possible to disassemble the floor panels without having access to their undersides. This known technology relying on clips suffers from the additional drawbacks:

Subsequent adjustment of the panels in their longitudinal direction is a complicated operation in connection with [10] laying, since the clips urge the panels tightly against each other.

Floor laying using clips is time-consuming.

This technique is usable only in those cases where the floor panels are resting on underlying joists with the [15] clips placed there between. For thin floors to be laid on a continuous, flat supporting structure, such clips cannot be used.

The floor panels can be joined together only at their long sides. No clip connection is provided on the short sides.[20]

TECHNICAL PROBLEMS AND OBJECTS OF THE INVENTION

A main object of the invention therefore is to provide a [25] system for joining together building panels, especially

floor panels for hard, floating floors, which allows using floor panels of a smaller overall thickness than present-day floor panels.

A particular object of the invention is to provide a [30] panel-joining system which

- makes it possible in a simple, cheap and rational way to provide a joint between floor panels without requiring the use of a glue, especially a joint based primarily only on mechanical connections between the panels; [35]
- can be used for joining floor panels which have a smaller thickness than present-day laminated floors and which have, because of the use of a different core material, superior properties than present-day floors even at a thickness of 3 mm; [40]
- makes it possible between thin floor panels to provide a joint that eliminates any unevennesses in the joint because of thickness tolerances of the panels;
- allows joining all the edges of the panels;
- reduces tool wear when manufacturing floor panels with[45] hard surface layers;
- allows repeated disassembly and reassembly of a floor previously laid, without causing damage to the panels, while ensuring high laying quality; [50]
- makes it possible to provide moisture-proof floors;
- makes it possible to obviate the need of accurate, separate placement of an underlay before laying the floor panels; and
- considerably cuts the time for joining the panels.[55]

These and other objects of the invention are achieved by means of a panel-joining system having the features recited in the appended claims.

Thus, the invention provides a system for making a joint along adjacent joint edges of two building panels, especially [60] floor panels, in which joint:

the adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at right angles to the principal plane of the panels, and [65]

a locking device arranged on the rear side of the panels forms a second mechanical connection locking the panels to

each other in a second direction parallel to the principal plane and at right angles to the joint edges, said locking device comprising a locking groove which extends parallel to and spaced from the joint edge of one of said panels, [5] termed groove panel, and which is open at the rear side of the groove panel, said system being characterised in

that the locking device further comprises a strip integrated with the other of said panels, termed strip panel, said strip extending throughout substantially the entire [10] length of the joint edge of the strip panel and being provided with a locking element projecting from the strip, such that when the panels are joined together, the strip projects on the rear side of the groove panel with its locking element received in the locking groove of [15]the groove panel.

that the panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and [20] is operative in said second mechanical connection,

that the first and the second mechanical connection both allow mutual displacement of the panels in the direction of the joint edges, and

that the second mechanical connection is so conceived as [25]to allow the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip.

The term "rear side" as used above should be considered to comprise any side of the panel located behind underneath [30] the front side of the panel. The opening plane of the locking groove of the groove panel can thus be located at a distance from the rear surface of the panel resting on the supporting structure. Moreover, the strip, which in the invention extends throughout substantially the entire length of the joint [35] edge of the strip panel, should be considered to encompass both the case where the strip is a continuous, uninterrupted element, and the case where the "strip" consists in its longitudinal direction of several parts, together covering the main portion of the joint edge.

[40] It should also be noted (i) that it is the first and the second mechanical connection as such that permit mutual displacement of the panels in the direction of the joint edges, and that (ii) it is the second mechanical connection as such that permits the locking element to leave the locking groove if [45] the groove panel is turned about its joint edge angularly away from the strip. Within the scope of the invention, there may thus exist means, such as glue and mechanical devices, that can counteract or prevent such displacement and/or upward angling.

[50] The system according to the invention makes it possible to provide concealed, precise locking of both the short and long sides of the panels in hard, thin floors. The floor panels can be quickly and conveniently disassembled in the reverse order of laying without any risk of damage to the panels, [55] ensuring at the same time a high laying quality.

The panels can be assembled and disassembled much faster than in present-day systems, and any damaged or worn-out panels can be replaced by taking up and re-laying parts of the floor.

According to an especially preferred embodiment of the [60] invention, a system is provided which permits precise joining of thin floor panels having, for example, a thickness of the order of 3 mm and which at the same time provides a tolerance-independent smooth top face at the joint. To this end, the strip is mounted in an equalising groove which is [65] countersunk in the rear side of the strip panel and which exhibits an exact, predetermined distance from its bottom to the front side of the strip panel. The part of the strip

[5]

projecting behind the groove panel engages a corresponding equalising groove, which is countersunk in the rear side of the groove panel and which exhibits the same exact, predetermined distance from its bottom to the front side of the groove panel. The thickness of the strip when is at least so [5] great that the rear side of the strip is flush with, and preferably projects slightly below the rear side of the panels. In this embodiment, the panels will always rest, in the joint, with their equalising grooves on a strip. This levels out the tolerance and imparts the necessary strength to the joint. The [10] strip transmits horizontal and upwardly-directed forces to the panels and downwardly-directed forces to the existing subfloor.

Preferably, the strip may consist of a material which is flexible, resilient and strong, and can be sawn. A preferred [15] strip material is sheet aluminium. In an aluminium strip, sufficient strength can be achieved with a strip thickness of the order of 0.5 mm.

In order to permit raking up previously laid, joined floor panels in a simple way, a preferred embodiment of the [20] invention is characterised in that when the groove panel is pressed against the strip panel in the second direction and is turned anglularly away from the strip, the maximum distance between the axis of rotation of the groove panel and the locking surface of the locking groove closest to the joint [25] edges is such that the locking element can leave the locking groove without contacting the locking surface of the locking groove. Such a disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm. [30]

According to the invention, the locking surface of the locking element is able to provide a sufficient locking function even with very small heights of the locking surface. Efficient locking of 3-mm floor panels can be achieved with a locking surface that is as low as 2 mm. Even a 0.5-mm- [35] high locking surface may provide sufficient locking. The term "locking surface" as used herein relates to the part of the locking element engaging the locking groove to form the second mechanical connection.

For optimal function of the invention, the strip and the [40] locking element should be formed on the strip panel with high precision. Especially, the locking surface of the locking element should be located at an exact distance from the joint edge of the strip panel.

Furthermore, the extent of the engagement in the floor [45] panels should be minimised, since it reduces the floor strength.

By known manufacturing methods, it is possible to produce a strip with a locking pin, for example by extruding aluminium or plastics into a suitable section, which is [50] thereafter glued to the floor panel or is inserted in special grooves. These and all other traditional methods do however not ensure optimum function and an optimum level of

economy. To produce the joint system according to the invention, the strip is suitably formed from sheet aluminium, [55] and is mechanically fixed to the strip panel.

The laying of the panels can be performed by first placing the strip panel on the subfloor and then moving the groove panel with its long side up to the long side of the strip panel, at an angle between the principal plane of the groove panel [60] and the subfloor. When the joint edges have been brought into engagement with each other to form the first mechanical connection, the groove panel is angled down so as to accommodate the locking element in the locking groove.

Laying can also be performed by first placing both the [65] strip panel and the groove panel flat on the subfloor and then joining the panels parallel to their principal planes while

[6]

bending the strip downwards until the locking element snaps up into the locking groove. This laying technique enables in particular mechanical locking of both the short and long sides of the floor panels. For example, the long sides can be [5] joined together by using the first laying technique with downward angling of the groove panel, while the short sides are subsequently joined together by displacing the groove panel in its longitudinal direction until its short side is pressed on and locked to the short side of an adjacent panel [10] in the same row.

In connection with their manufacture, the floor panels can be provided with an underlay of e.g. floor board, foam or felt. The underlay should preferably cover the strip such that the joint between the underlays is offset in relation to the [15] joint between the floor panels.

The above and other features and advantages of the invention will appear from the appended claims and the following description of embodiments of the invention.

The invention will now be described in more detail [20] hereinbelow with reference to the accompanying drawing Figures.

DESCRIPTION OF DRAWING FIGURES

FIGS. **1*a*** and **1*b*** schematically show in two stages how [25] two floor panels of different thickness are joined together in floating fashion according to a first embodiment of the invention.

FIGS. **2*a-c*** show in three stages a method for mechanically joining two floor panels according to a second embodi-[30] ment of the invention.

FIGS. **3*a-c*** show in three stages another method for mechanically joining the floor panels of FIGS. **2*a-c***.

FIGS. **4*a*** and **4*b*** show a floor panel according to FIGS. **2*a-c*** as seen from below and from above, respectively.

[35] FIG. **5** illustrates in perspective a method for laying and joining floor panels according to a third embodiment of the invention.

FIG. **6** shows in perspective and from below a first variant [40] for mounting a strip on a floor panel.

FIG. **7** shows in section a second variant for mounting a strip on a floor panel.

DESCRIPTION OF PREFERRED [45] EMBODIMENTS

FIGS. **1*a*** and **1*b***, to which reference is now made, illustrate a first floor panel **1**, hereinafter termed strip panel, and a second floor panel **2**, hereinafter termed groove panel. The terms "strip panel" and "groove panel" are merely [50] intended to facilitate the description of the invention, the panels **1**, **2** normally being identical in practice. The panels **1** and **2** may be made from compact laminate and may have a

thickness of about 3 mm with a thickness tolerance of about ±0.2 mm. Considering this thickness tolerance, the [55] panels **1**, **2** are illustrated with different thicknesses (FIG. **1***b*), the strip panel 1 having a maximum thickness (3.2 mm) and the groove panel **2** having a minimum thickness (2.8 mm).

To enable mechanical joining of the panels **1**, **2** at [60] opposing joint edges, generally designated **3** and **4**, respectively, the panels are provided with grooves and strips as described in the following.

Reference is now made primarily to FIGS. **1***a* and **1***b*, and secondly to FIGS. **4***a* and **4***b* showing the basic design of the [65] floor panels from below and from above, respectively.

From the joint edge **3** of the strip panel **1**, i.e. the one long side, projects horizontally a flat strip **6** mounted at the

[7]

factory on the underside of the strip panel **1** and extending throughout the entire joint edge **3**. The strip **6**, which is made of flexible, resilient sheet aluminium, can be fixed mechanically, by means of glue or in any other suitable way. In FIGS. **1***a* and **1***b*, the strip **6** is glued, while in FIGS. **4***a* [5] and **4***b* it is mounted by means of a mechanical connection, which will be described in more detail hereinbelow.

Other strip materials can be used, such as sheets of other metals, as well as aluminium or plastics sections. Alternatively, the strip **6** may be integrally formed with the [10] strip panel **1**. At any rate, the strip **6** should be integrated with the strip panel **1**, i.e. it should not be mounted on the strip panel **1** in connection with laying. As a non-restrictive example, the strip **6** may have a width of about 30 mm and a thickness of about 0.5 mm.[15]

As appears from FIGS. **4***a* and **4***b*, a similar, although shorter strip **6'** is provided also at one short side **3'** of the strip pane **1**. The shorter strip **6'** does however not extend

throughout the entire short side **3'** but is otherwise identical with the strip **6** and, therefore, is not described in more detail here.[20]

The edge of the strip **6** facing away from the joint edge **3** is formed with a locking element **8** extended throughout the entire strip **6**. The locking element **8** has a locking surface **10** facing the joint edge **3** and having a height of e.g. 0.5 mm. The locking element **8** is so designed that when the floor is [25] being laid and the strip panel **2** of FIG. **1*a*** is pressed with its joint edge **4** against the joint edge **3** of the strip panel **1** and is angled down against the subfloor **12** according to FIG. **1*b***, it enters a locking groove **14** formed in the underside **16** of the groove panel **2** and extending parallel to and spaced from [30] the joint edge **4**. In FIG. **1*b***, the locking element **8** and the locking groove **14** together form a mechanical connection locking the panels **1**, **2** to each other in the direction designated D2. More specifically, the locking surface **10** of [35] the locking element **8** serves as a stop with respect to the surface of the locking groove **14** closest to the joint edge **4**.

When the panels **1** and **2** are joined together, they can however occupy such a relative position in the direction D2 that there is a small play Δ between the locking surface **10** [40] and the locking groove **14**. This mechanical connection in the direction D2 allows mutual displacement of the panels **1**, **2** in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action.[45]

As appears from FIGS. **4*a*** and **4*b***, each panel in the system has a strip **6** at one long side **3** and a locking groove **14** at the other long side **4**, as well as a strip **6'** at one short side **3'** and a locking groove **14'** at the other short side **4'**.

Furthermore, the joint edge **3** of the strip panel **1** has in its [50] underside **18** a recess **20** extending throughout the entire joint edge **3** and forming together with the upper face **22** of

the strip **6** a laterally open recess **24**. The joint edge **4** of the groove panel **2** has in its top side **26** a corresponding recess **28** forming a locking tongue **30** to be accommodated in the [55] recess **24** so as to form a mechanical connection locking the joint edges **3**, **4** to each other in the direction designated D1. This connection can be achieved with other designs of the joint edges **3**, **4**, for example by a bevel thereof such that the joint edge **4** of the groove panel **2** passes obliquely in [60] underneath the joint edge **3** of the strip panel **1** to be locked between that edge and the strip **6**.

The panels **1**, **2** can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again.[65]

The strip **6** is mounted in a tolerance-equalising groove **40** in the underside **18** of the strip panel **1** adjacent the joint

[8]

edge **3**. In this embodiment, the width of the equalising groove **40** is approximately equal to half the width of the strip **6**, i.e. about 15 mm. By means of the equalising groove **40**, it is ensured that there will always exist between the top [5] side **21** of the panel **1** and the bottom of the groove **40** an exact, predetermined distance E which is slightly smaller than the minimum thickness (2.8 mm) of the floor panels **1**, **2**. The groove panel **2** has a corresponding tolerance-equalising surface or groove **42** in the underside **16** of the [10] joint edge **4**. The distance between the equalising surface **42** and the top side **26** of the groove panel **2** is equal to the aforementioned exact distance E. Further, the thickness of the strip **6** is so chosen that the underside **44** of the strip is situated slightly below the undersides **18** and **16** of the floor [15] panels **1** and **2**, respectively. In this manner, the entire joint will rest on the strip **6**, and all vertical downwardly-directed forces will be efficiently transmitted to the subfloor **12** without any stresses

being exerted on the joint edges **3**, **4**. Thanks to the provision of the equalising grooves **40**, **42**, an [20] entirely even joint will be achieved on the top side, despite the thickness tolerances or the panels **1**, **2**, without having to perform any grinding or the like across the whole panels. Especially, this obviates the risk of damage to the bottom layer of the compact laminate, which might give rise to [25] bulging of the panels.

Reference is now made to the embodiment of FIGS. **2*a-c*** showing in a succession substantially the same laying method as in FIGS. **1*a*** and **1*b***. The embodiment of FIGS. **2*a-c*** primarily differs from the embodiment of FIGS. **1*a*** and [30] **1*b*** in that the strip **6** is mounted on the strip panel **1** by means of a mechanical connection instead of glue. To provide this mechanical connection, illustrated in more detail in FIG. **6**, a groove **50** is provided in the underside **18** of the strip panel **1** at a distance from the recess **24**. The groove **50** may be [35] formed either as a continuous groove extending throughout the entire length of the panel **1**, or as a number of separate grooves. The groove **50** defines, together with the recess **24**, a dovetail gripping edge **52**, the underside of which exhibits an exact equalising distance E to the top side **21** of the strip [40] panel **1**. The aluminium strip **6** has a number of punched and bent tongues **54**, as well as one or more lips **56** which are bent round opposite sides of the gripping edge **52** in clamping engagement therewith. This connection is shown in detail from below in the perspective view of FIG. **6**.

[45] Alternatively, a mechanical connection between the strip **6** and the strip panel **1** can be provided as illustrated in FIG. **7** showing in section a cut-away part of the strip panel **1** turned upside down. In FIG. **7**, the mechanical connection comprises a dovetail recess **58** in the underside **13** of the [50] strip panel **1**, as well as tongues/lips **60** punched and bent from the strip **6** and clamping against opposing inner sides of the recess **58**.

The embodiment of FIGS. **2*a-c*** is further characterised in that the locking element **3** of the strip **6** is designed as a [55] component bent from the aluminium sheet and having an operative locking surface **10** extending at right angles up from the front side **22** of the strip **6** through a height of e.g. 0.5 mm, and a rounded guide surface **34** facilitating the insertion of the locking element **8** into the locking groove **14** [60] when angling down the groove panel **2** towards the subfloor **12** (FIG. **2*b***), as well as a portion **36** which is inclined towards the subfloor **12** and which is not operative in the laying method illustrated in FIGS. **2a-c**.

Further, it can be seen from FIGS. **2*a-c*** that the joint edge [65] **3** of the strip panel **1** has a lower bevel **70** which cooperates during laying with a corresponding upper bevel **72** of the joint edge **4** of the groove panel **2**, such that the panels **1** and

[9]

2 are forced to move vertically towards each other when their joint edges **3**, **4** are moved up to each other and the panels are pressed together horizontally.

Preferably, the locking surface **10** is so located relative to the joint edge **3** that when the groove panel **2**, starting from [5] the joined position in FIG. **2*c***, is pressed horizontally in the direction D2 against the strip panel **1** and is turned angularly up from the strip **6**, the maximum distance between the axis of rotation A of the groove panel **2** and the locking surface **10** of the locking groove is such that the locking element **8** [10] can leave the locking groove **14** without coming into contact with it.

FIGS. **3*a*-3*b*** show another joining method for mechanically joining together the floor panels of FIGS. **2*a-c***. The method illustrated in FIGS. **3*a-c*** relies on the fact that the [15] strip **6** is resilient and is especially useful for joining

together the short sides of floor panels which have already been joined along one long side as illustrated in FIGS. **2*a-c***. The method of FIGS. **3*a-c*** is performed by first placing the two panels **1** and **2** flat on the subfloor **12** and then moving them [20] horizontally towards each other according to FIG. **3*b***. The inclined portion **36** of the locking element **8** then serves as a guide surface which guides the joint edge **4** of the groove panel **2** up on to the upper side **22** of the strip **6**. The strip **6** will then be urged downwards while the locking element [25] **8** is sliding on the equalising surface **42**. When the joint edges **3**, **4** have been brought into complete engagement with each other horizontally, the locking element **8** will snap into the locking groove **14** (FIG. **3*c***), thereby providing the same locking as in FIG. **2*c***. The same locking method can [30] also be used by placing, in the initial position, the joint edge **4** of the groove panel with the equalising groove **42** on the locking element **10** (FIG. **3*a***). The inclined portion **36** of the locking element **10** then is not operative. This technique thus makes it possible to lock the floor panels mechanically in all [35] directions, and by repeating the laying operations the whole floor can be laid without using any glue.

The invention is not restricted to the preferred embodiments described above and illustrated in the drawings, but several variants and modifications thereof are conceivable [40] within the scope of the appended claims. The strip **6** can be divided into small sections covering the major part of the joint length. Further, the thickness of the strip **6** may vary throughout its width. All strips, locking grooves, locking elements and recesses are so dimensioned as to enable [50] laying the floor panels with flat top sides in a manner to rest on the strip **6** in the joint. If the floor panels consist of compact laminate and if silicone or any other sealing compound, a rubber strip or any other sealing device is applied prior to laying between the flat projecting part of the

strip **6** and the groove panel **2** and/or in the recess **26**, a moisture-proof floor is obtained.

As appears from FIG. **6**, an underlay **46**, e.g. of floor board, foam or felt, can be mounted on the underside of the [55] panels during the manufacture thereof. In one embodiment, the underlay **46** covers the strip **6** up to the locking element **8**, such that the joint between the underlays **46** becomes offset in relation to the joint between the joint edges **3** and **4**.[60]

In the embodiment of FIG. **5**, the strip **6** and its locking element **8** are integrally formed with the strip panel **1**, the projecting part of the strip **6** thus forming an extension of the lower part of the joint edge **3**. The locking function is the same as in the embodiments described above. On he under-[65] side **18** of the strip panel **1**, there is provided a separate strip, band or the like **74** extending throughout the entire length of

[10]

the joint and having, in this embodiment, a width covering approximately the same surface as the separate strip **6** of the previous embodiments. The strip **74** can be provided directly on the rear side **18** or in a recess formed therein (not shown), [5] so that the distance from the front side **21**, **26** of the floor to the rear side **76**, including the thickness of the strip **74**, always is at least equal to the corresponding distance in the panel having the greatest thickness tolerance. The panels **1**, **2** will then rest, in the joint, on the strip **74** or only on the [10] undersides **18**, **16** of the panels, if these sides are made plane.

When using a material which does not permit downward bending of the strip **6** or the locking element **8**, laying can be performed in the way shown in FIG. **5**. A floor panel **2*a*** [15] is moved angled upwardly with its long side **4*a*** into engagement with the long side **3** of a previously laid floor

panel **1** while at the same time a third floor panel **2*b*** is moved with its short side **4*b***' into engagement with the short side **3*a***' of the upwardly-angled floor panel **2*a*** and is fastened by [20] angling the panel **2*b*** downwards. The panel **2*b*** is then pushed along the short side **3*a***' of the upwardly-angled floor panel ***2a*** until its long side **4*b*** encounters the long side **3** of the initially-laid panel **1**. The two upwardly-angled panels **2*a*** and **2*b*** are therefore angled down on to the subfloor **12** [25] so as to bring about locking.

By a reverse procedure the panels can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again.

Several variants of preferred laying methods are conceiv-[30]able. For example, the strip panel can be inserted under the groove panel, thus enabling the laying of panels in all four directions with respect to the initial position.

What is claimed is:

1. An edge lock for use in a flooring system having a [35] plurality of floor panels, the edge lock for mechanically and releasably locking together adjacent edges of pairs of adjacent floor panels during assembly of the flooring system and when said adjacent floor panels are laying flat on a subfloor with upper corner portions of said adjacent edges being [40] mutually spaced apart, said edge lock comprising:

locking means for forming a first mechanical connection for locking said adjacent edges to each other in a vertical direction, and for forming a second mechanical [45] connection for locking said adjacent edges to each other in a horizontal direction at right angles to said edges, said locking means including:

(i) a locking groove extending parallel to and spaced from a first one of the adjacent edges of one of the [50] adjacent floor panels and being open at

a rear side of said one adjacent floor panel, and

(ii) a flexible and resilient locking strip integrated with another of the adjacent floor panels, said locking strip extending throughout substantially an entire [55] length of an edge of the another adjacent floor panel, said locking strip being provided with a locking element projecting from the locking strip,

said locking means being constructed so as to operate as a one-way snap lock in said horizontal direction during [60] the assembly of said flooring system when displacing said adjacent edges towards each other by resiliently urging the flexible locking strip downwards until the upper corner portions of said adjacent edges have been brought into complete engagement with each other and [65] the locking element thereby snaps into the locking groove to prevent drifting apart of said adjacent edges, and

[11]

said locking means also being constructed so as to enable said adjacent panels, while they are mechanically connected to each other by said first and second mechanical connections, to be turned in relation to each other about said upper corner portions of their locked- [50] together edges in an angular direction so as to move the locking element out of the locking groove in order to unlock said one-way snap lock.

2. The edge lock as claimed in claim 1, wherein said first mechanical connection is a tongue-and-groove connection, [10] including a tongue and a tongue groove for receiving said tongue.

3. The edge lock as claimed in claim 2, wherein said tongue groove is limited upwardly by an upper lip which is formed in one piece with its corresponding panel and [15] wherein said tongue is made in one piece with its corresponding panel.

4. The edge lock as claimed in claim 2, wherein said tongue groove is limited downwardly by a lower lip which is formed in one piece with its corresponding panel and [20] which defines said locking strip.

5. The edge lock as claimed in claim 4, wherein a thickness of said locking strip varies in its width direction.

6. The edge lock as claimed claim 2, wherein said adjacent edges being provided with co-operating lower and [25] upper bevels, said lower bevel being formed at a tip of an upper lip which limits said tongue groove upwardly, and said upper bevel being formed in a tip of said tongue.

7. The edge lock as claimed in claim 2, wherein a tip of said tongue presents a lower surface portion which is [30] nonparallel to an adjacent surface portion of the tongue groove located underneath said lower surface portion.

8. The edge lock as claimed in claim 1, wherein said locking strip is integrally formed with said another panel, i.e., made in one piece therewith.[35]

9. The edge lock as claimed in claim 8, wherein a thickness of said locking strip varies in its width direction.

10. The edge lock as claimed in claim 1, wherein said locking strip is made of a material different from that of said another floor panel and is fixedly mounted on said another [40] panel at the factory.

11. The edge lock as claimed in claim **1**, wherein said adjacent edges being provided with co-operating lower and upper bevels.

12. The edge lock as claimed in claim **1**, wherein the [45] locking element consists of a locking edge extending continuously along the locking strip.

13. A short-edge lock for use in a flooring system having a plurality of rectangular floor panels arranged in parallel panel rows, the short-edge lock for mechanically and releas- [50] ably locking together adjacent short edges of pairs of adjacent floor panels in a new row during assembly of the flooring system when said adjacent floor panels are already mechanically joined to a common long edge of a floor panel in an adjacent panel row and are laying flat on a subfloor [55] with upper corner portions of said adjacent short edges being mutually spaced apart, said short-edge lock comprising:

locking means for forming a first mechanical connection for locking said adjacent short edges to each other in a vertical direction, and for forming a second mechanical [60] connection for locking said adjacent short edges to each other in a horizontal direction at right angles to said short edges, said locking means including:

(i) a locking groove extending parallel to and spaced from a first one of the adjacent short edges of one of [65] the adjacent floor panels and being open at the rear side of said one adjacent floor panel, and

(ii) a flexible and resilient locking strip integrated with another of the adjacent floor panels, said locking strip

extending throughout substantially an entire length of a short edge of the another adjacent floor [5] panel, said locking strip being provided with a locking element projecting from the locking strip,

said locking means being constructed so as to operate as a one-way snap lock in said horizontal direction during the assembly of said flooring system when displacing [10] said adjacent short edges towards each other by resiliently urging the flexible locking strip downwards until upper corner portions of said adjacent short edges have been brought into complete engagement with each other and the locking element thereby snaps into the [15] locking groove for preventing drifting apart of said adjacent short edges.

14. The short-edge lock as claimed in claim **13**, wherein said locking means being constructed so as to enable said adjacent panels, while they are mechanically connected to[20] each other by said first and second mechanical connections, to be turned in relation to each other about said upper corner portions of their locked-together short edges in an angular direction so as to move the locking element out of the locking groove in order to unlock said one-way snap lock.

[25] **15**. The short-edge lock as claimed in claim **13**, wherein said first mechanical connection is a tongue-and-groove connection, including a tongue and a tongue groove for receiving said tongue.

16. The short-edge lock as claimed in claim **15**, wherein [30] said tongue groove is limited upwardly by an upper lip which is formed in one piece with its corresponding panel and wherein said tongue is made in one piece with its corresponding panel.

17. The short-edge lock as claimed in claim **15**, wherein [35] said tongue groove is limited downwardly by a lower lip which is formed in one piece with its corresponding panel and which defines said locking strip.

18. The short-edge lock as claimed in claim **17**, wherein a thickness of said locking strip varies in its width direction.

[40] **19**. The short-edge lock as claimed claim **15**, wherein said adjacent short edges being provided with co-operating lower and upper bevels, said lower bevel being formed at a tip of an upper lip which limits said tongue groove upwardly, and said upper bevel being formed in a tip of said tongue.

[45] **20**. The short-edge lock as claimed in claim **15**, wherein a tip of said tongue presents a lower surface portion which is nonparallel to an adjacent surface portion of the tongue groove located underneath said lower surface portion.

21. The short-edge lock as claimed in claim 13, wherein [50] said locking strip is integrally formed with said another panel, i.e., made in one piece therewith.

22. The short-edge lock as claimed in claim **21**, wherein a thickness of said locking strip varies in its width direction.

23. The short-edge lock as claimed in claim **13**, wherein [55] said locking strip is made of a material different from that of said another floor panel and is fixedly mounted on said another floor panel at the factory.

24. The short-edge lock as claimed in claim **13**, wherein said adjacent short edges being provided with co-operating [60] lower and upper bevels.

25. The short-edge lock as claimed in claim **13**, wherein the locking element consists of a locking edge extending continuously along the locking strip.

26. An edge lock for use in a flooring system having a [65] plurality of floor panels arranged in parallel panel rows and having pairs of opposite first edges and pairs of opposite second edges, the edge lock for mechanically and releasably

[13]

locking together adjacent first edges of pairs of adjacent floor panels in a new row during assembly of the flooring system when said adjacent floor panels are already mechanically joined to a common second edge of a floor panel in an adjacent panel row and are laying flat on a subfloor with [5] upper corner portions of said adjacent first edges being mutually spaced apart, said edge lock comprising:

locking means for forming a first mechanical connection for locking said adjacent first edges to each other in a vertical direction, and for forming a second mechanical [10] connection for locking said adjacent short edges to each other in a horizontal direction at right angles to said first edges, said locking means including:

(i) a locking groove extending parallel to and spaced from a first one of [15] the adjacent first edges of one of the adjacent floor panels and being open at the rear side of said one adjacent floor panel, and

(ii) a flexible and resilient locking strip integrated with another of the adjacent floor panels, said locking strip extending throughout substantially an entire [20] length of a first edge of the another adjacent floor panel, said locking strip being provided with a locking element projecting from the locking strip,

said locking means being constructed so as to operate as a one-way snap lock in said horizontal direction during the assembly of said flooring system when displacing [25] said adjacent first edges towards each other by resiliently urging the flexible

locking strip downwards until upper corner portions of said adjacent first edges have been brought into complete engagement with each other and the locking element thereby snaps into [30] the locking groove for preventing drifting apart of said adjacent first edges.

27. The edge lock as claimed in claim **26**, wherein said locking means being constructed so as to enable said adjacent panels, while they are mechanically connected to each [35] other by said first and second mechanical connections, to be turned in relation to each other about said upper corner portions of their locked-together first edges in an angular direction so as to move the locking element out of the locking groove in order to unlock said one-way snap lock.[40]

28. The edge lock as claimed in claim **26**, wherein said first mechanical connection is a tongue-and-groove connection, including a tongue and a tongue groove for receiving said tongue.

29. The edge lock as claimed in claim **28**, wherein said [45] tongue groove is limited upwardly by an upper lip which is formed in one piece with its corresponding panel and wherein said tongue is made in one piece with its corresponding panel.

30. The edge lock as claimed in claim **28**, wherein said [50] tongue groove is limited downwardly by a lower lip which is formed in one piece with its corresponding panel and which defines said locking strip.

31. The edge lock as claimed in claim **30**, wherein a thickness of said locking strip varies in its width direction.[55]

32. The edge lock as claimed claim **28**, wherein said adjacent first edges being provided with co-operating lower and upper bevels, said lower bevel being formed at a tip of an upper lip which limits said tongue groove upwardly, and said upper bevel being formed in a tip of said tongue.[60]

33. The edge lock as claimed in claim **28**, wherein a tip of said tongue presents a lower surface portion which is nonparallel to an adjacent surface portion of the tongue groove located underneath said lower surface portion.

34. The edge lock as claimed in claim **26**, wherein said [65] locking strip is integrally formed with said another panel, i.e., made in one piece therewith.

[14]

35. The edge lock as claimed in claim **34**, wherein a thickness of said locking strip varies in its width direction.

36. The edge lock as claimed in claim **26**, wherein said flexible and resilient locking strip integrated with said [5] another floor panel is made of a material different from that of said another floor panel and is fixedly mounted on said another panel at the factory.

37. The edge lock as claimed in claim **26**, wherein said adjacent edges being provided with co-operating lower and [10] upper bevels.

38. The edge lock as claimed in claim **26**, wherein the locking element consists of a locking edge extending continuously along the locking strip.

39. A flooring system comprising a plurality of rectangular floor panels which are mechanically connectable to each [15] other in parallel rows along adjacent long edges and short edges, respectively, of the panels, said floor panels being provided with means for mechanically locking together their long edges as well as their short edges in a first direction at right angles to a principal plane of the panels, thereby [20] forming first mechanical connections between the panels,

each panel, at a rear side thereof, being provided:

(i) with a locking strip at one long edge and at one short edge, each locking strip extending throughout substantially

an entire length of the corresponding edge [25] of the panel and being provided with a projecting locking element, and

(ii) with a locking groove at an opposite long edge and at an opposite short edge, each locking groove extending parallel to and spaced from the corre- [30] sponding edge and being open at the rear side of the panel, said locking strips and locking grooves forming second mechanical connections locking the panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges [35] such that a locking strip of a first one of two joined panels projects on the rear side of the second panel with its locking element received in the locking groove of the second panel,

the first and the second mechanical connections are so [40]constructed as to allow mutual displacement of the panels in the direction of the long edges,

the second mechanical connection along the long edges is so constructed as to allow the locking element to leave the locking groove if the panel associated with the [45] locking groove is turned about its long edge angularly away from the strip, and

each locking strip at the short edges is flexible and resilient such that two of the floor panels, having already been mechanically joined to a common long [50] edge of a third of the floor panels, can be mechanically joined together at their adjacent short edges by displacing said two panels

horizontally towards each other, while resiliently urging the flexible strip at one of said short edges downwards, until said adjacent short edges [55] of the two panels have been brought into complete engagement with each other horizontally and the locking clement at said one short edge thereby snaps into the locking groove at the adjacent short edge.

40. The flooring system as claimed in claim **39**, wherein [60] the first mechanical connection as well as the second mechanical connection along the long edges are such that they allow the locking element to enter the locking groove if the panel associated with the groove is turned about its joint edge angularly towards the strip while holding the [65] upper part of the joint edge of the panel associated with the groove in contact with the upper part of the joint edge of the adjacent panel associated with the strip.

[15]

41. The flooring system as claimed in claim **39**, wherein the first mechanical connection as well as the second mechanical connection along the long edges are such that they allow the locking element to leave the locking groove if the panel associated with the groove is turned about its [5] joint edge angularly away from the strip while holding the upper part of the joint edge of the panel associated with the groove in contact with the upper part of the joint edge of the adjacent panel associated with the strip.

42. The flooring system as claimed in claim **39**, wherein [10] in order to resiliently urge the flexible strip downwards while displacing said adjacent short edges horizontally towards each other, said adjacent short edges being provided with cooperating lower and upper bevels such that the panels are forced to move vertically towards each other when their

[15] adjacent short edges are moved up to each other and the panels are pressed together horizontally.

43. The flooring system as claimed in claim **39**, wherein a locking surface of the locking element is extended from a front side of the strip through a height in said first direction that is less than or equal to 2 mm. [20]

44. The flooring system as claimed in claim **39**, wherein the locking element comprises a locking edge extending continuously along the strip.

45. The flooring system as claimed in claim **39**, wherein an underlay of floor boards, foam, felt or the like, is fixed to [25] the rear sides of the panels.

46. The flooring system as claimed in claim **45**, wherein the underlay is fixed so as to cover the strip in said second direction at least up to the locking element such that a joint between the underlays of the two adjacent panels is offset in [30] said second direction relative to the joint edges.

47. The flooring system as claimed in claim **39**, wherein a sealing means, such as a sealing compound, a rubber strip, or the like, is provided on a front side of the strip between the locking element and the joint edge of the panel associ- [35] ated with the strip to seal against the other panel.

48. The flooring system as claimed in claim **39**, wherein each locking strip is integrally formed in one piece with the respective panel and forming an extension of a lower part of the corresponding edge of the respective panel.

49. The flooring system as claimed in claim **39**, wherein [40] the panels are constructed such that, when joined together along their long edges occupy a relative position in the second direction such that a play exists between the locking groove and a locking surface of the locking element that is facing the long edges, such that the second mechanical [45] connection allows mutual displacement of the panels in the direction of the long edges.

50. A flooring system, comprising a plurality of floor panels which are mechanically connectable to each other in parallel rows along adjacent first edges and second edges, [50] respectively, of the panels, said floor panels being provided with means for mechanically locking together their first edges as well as their second edges in a first direction at right angles to a principal plane of the panels, thereby forming first mechanical connections between the panels, wherein: [55]

each panel, at a rear side thereof, being provided:

(i) with a locking strip at one first edge and at one second edge, each locking strip extending throughout substantially an entire length of the corresponding first edge of the panel and being provided with a 6o projecting locking element, and

(ii) with a locking groove at an opposite first edge and at an opposite short edge, each locking groove extending parallel to and spaced from the corresponding edge and being open at the rear side of the panel, said locking strips and locking grooves form-

ing second mechanical connections locking the pan-eis to each other in a second direction parallel to the principal plane and at right angles to the joint edges, such that a strip of a first one of two joined panels [5] projects on the rear side of the second panel with its locking element received

in the locking groove of the second panel,

the first and the second mechanical connections are so constructed so as to allow mutual displacement of the [10] panels in the direction of the first edges,

the second mechanical connection along the first edge is so constructed as to allow the locking element to leave the locking groove if the panel associated with the locking groove is turned about its first edge angularly [15] away from the strip, and

each locking strip at the second edge is flexible and resilient such that two panels, having already been mechanically joined to a common first edge of a third panel, can be mechanically joined together at their [20] adjacent second edge by displacing said two panels horizontally towards each other, while resiliently urging the flexible strip at one of said second edges downwards, until said adjacent second edges of the two panels have been brought into complete engagement [25] with each other horizontally and the locking element at said one second edge thereby snaps into the locking groove at the adjacent second edge.

51. The flooring system as claimed in claim **50**, wherein said first mechanical connections include a tongue-and- [30] groove connection, including a tongue and a tongue groove for receiving said tongue.

52. The flooring system as claimed in claim **51**, wherein said tongue groove is limited upwardly by an upper lip which is formed in one piece with its corresponding panel [35] and wherein said tongue is made in one piece with its corresponding panel.

53. The flooring system as claimed in claim **51**, wherein said tongue groove is limited downwardly by a lower lip

which is formed in one piece with its corresponding panel and which defines said locking strip.

[40] **54.** The flooring system as claimed in claim **53**, wherein a thickness of said locking strip varies in its width direction.

55. The flooring system as claimed claim **51**, wherein said adjacent edges being provided with co-operating lower and upper bevels, said lower bevel being formed at a tip of an [45] upper lip which limits said tongue groove upwardly, and said upper bevel being formed in a tip of said tongue.

56. The flooring system as claimed in claim **51**, wherein a tip of said tongue presents a lower surface portion which is nonparallel to an adjacent surface portion of the tongue [50] groove located underneath said lower surface portion.

57. The flooring system as claimed in claim **50**, wherein said locking strip is integrally formed with said second panel, i.e., made in one piece therewith.

58. The flooring system as claimed in claim **57**, wherein [55] a thickness of said locking strip varies in its width direction.

59. The flooring system as claimed in claim **50**, wherein said locking strip is made of a material different from that of said second panel and is fixedly mounted on said another panel at the factory.

60. The flooring system as claimed in claim **50**, wherein [60] said adjacent edges being provided with co-operating lower and upper bevels.

61. The flooring system as claimed in claim **50**, wherein the locking element consists of a locking edge extending continuously along the locking strip.

* * * * *

APPENDIX H

UNITED STATES PATENT

Patent No. 5,706,621

See Fold Out Exhibits
Diagrams

US005706621A

United States Patent [19]

Pervan

[11] Patent Number: 5,706,621

[45] Date of Patent: Jan. 13, 1998

[54] **SYSTEM FOR JOINING BUILDING BOARDS**

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[73] Assignee: **Välinge Aluminum AB**, Viken, Sweden

[21] Appl. No.: **436,224**

[22] PCT Filed: **Apr. 29, 1994**

[86] PCT No.: **PCT/SE94/00386**

§ 371 Date: **May 17, 1995**

§ 102(e) Date: **May 17, 1995**

[87] PCT Pub. No.: **WO94/26999**

PCT Pub. Date: **Nov. 24, 1994**

[30] **Foreign Application Priority Data**

May 10, 1993 [SE] Sweden 9301595

[51] **Int. Cl.**[6] **E04F 15/22**

[52] **U.S. Cl.** **52/403.1**; 52/480; 52/506.05; 52/551

[58] **Field of Search** 52/480, 550, 551, 52/506.05, 403.1

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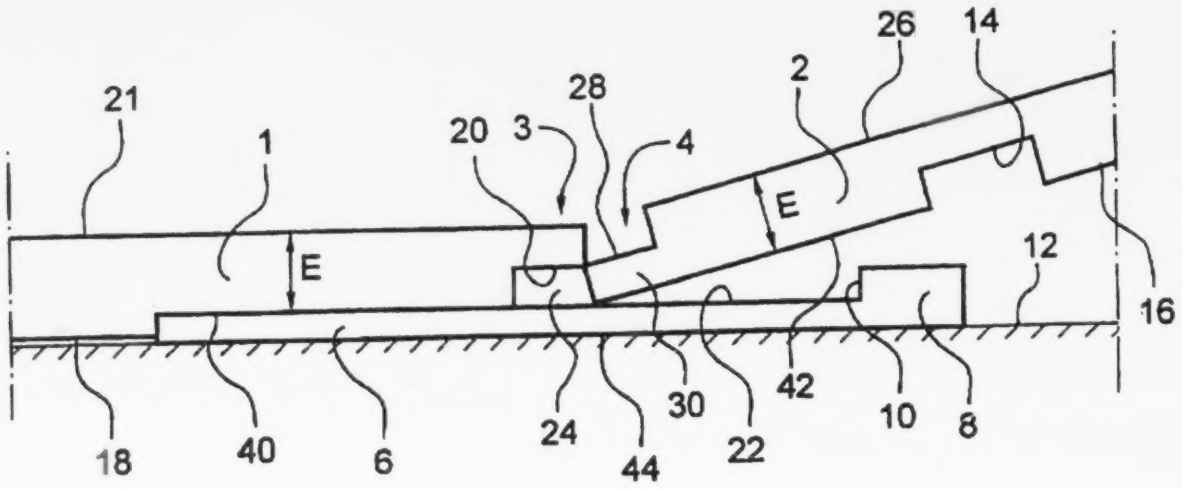
Primary Examiner—Carl D. Friedman
Assistant Examiner—Yvonne Horton-Richardson
Attorney, Agent, or Firm—Burns, Doane, Swecker & Mathis, L.L.P.

[57] **ABSTRACT**

The invention relates to a system for laying and mechanically joining building panels, especially thin, hard, floating floors. Adjacent joint edges (3, 4) of two panels (1, 2) engage each other to provide a first mechanical connection locking the joint edges (3, 4) in a first direction (D1) perpendicular to the principal plane of the panels. In each joint, there is further provided a strip (6) which is integrated with one joint edge (3) and which projects behind the other joint edge (4). The strip (6) has an upwardly protruding locking element (8) engaging in a locking groove (14) in the rear side (16) of the other joint edge (4) to form a second mechanical connection locking the panels (1, 2) in a second direction (D2) parallel to the principal plane of the panels and at right angles to the joint. Both the first and the second mechanical connections allow mutual displacement of joined panels (1, 2) in the direction of the joint.

23 Claims, 6 Drawing Sheets



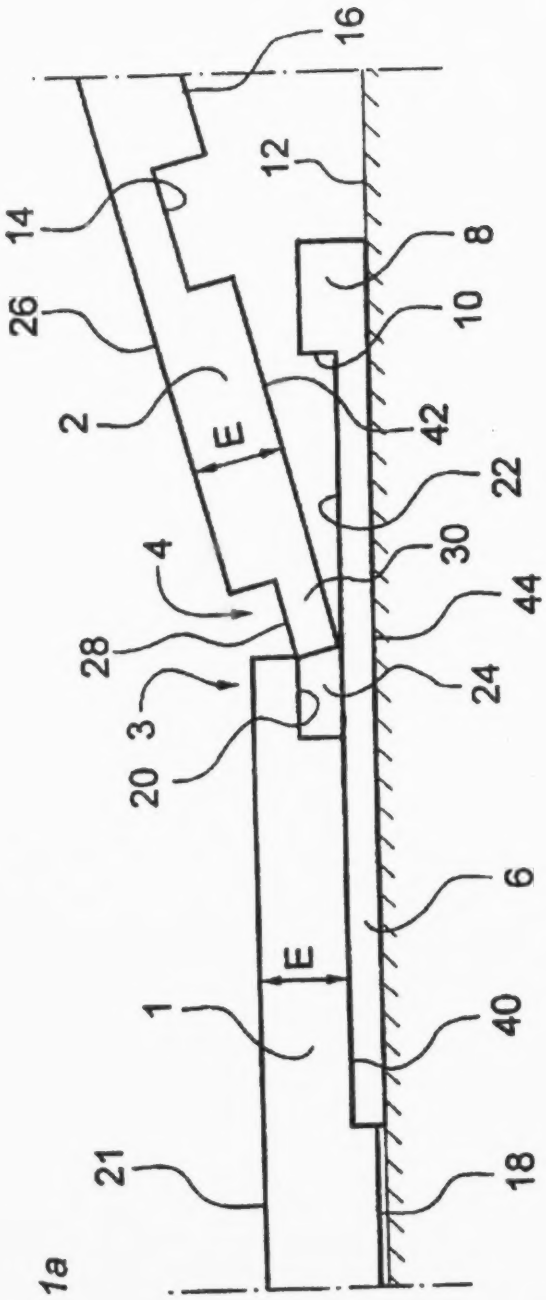

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Fig. 1a

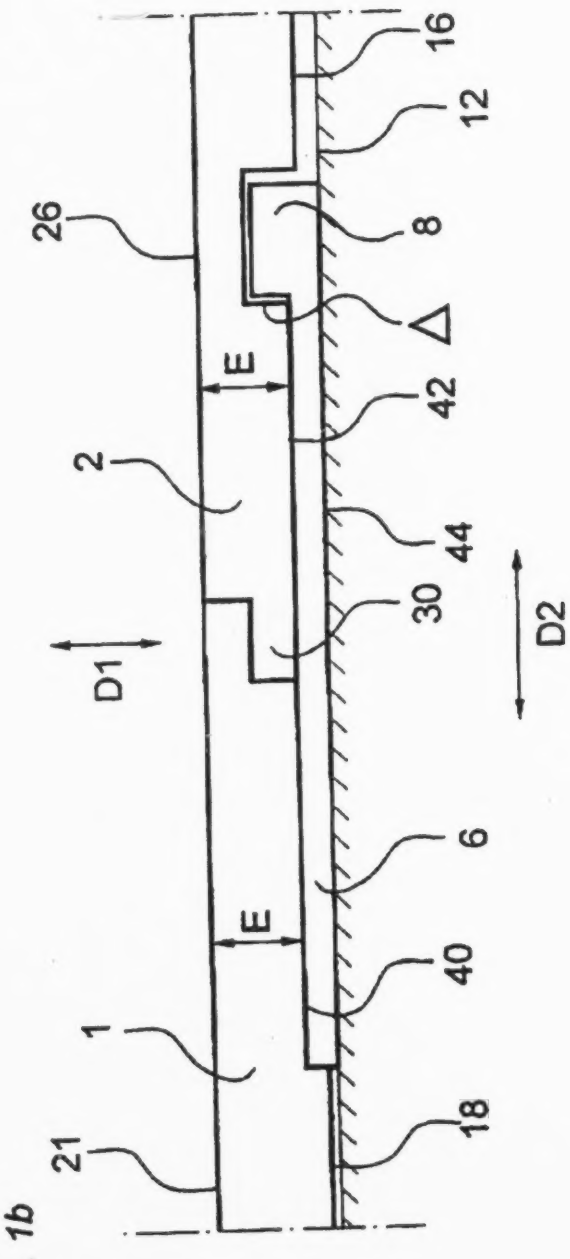
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Fig. 1b

Fig. 2a

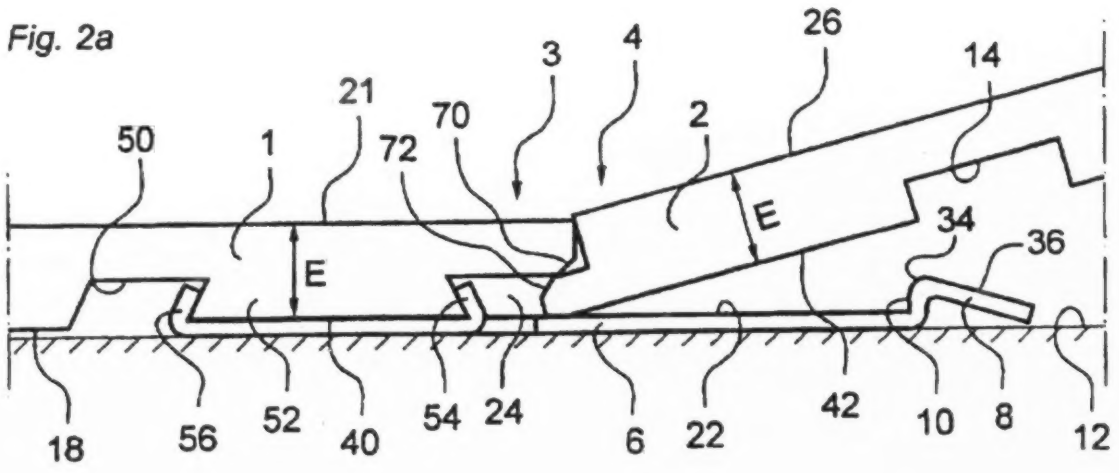


Fig. 2b

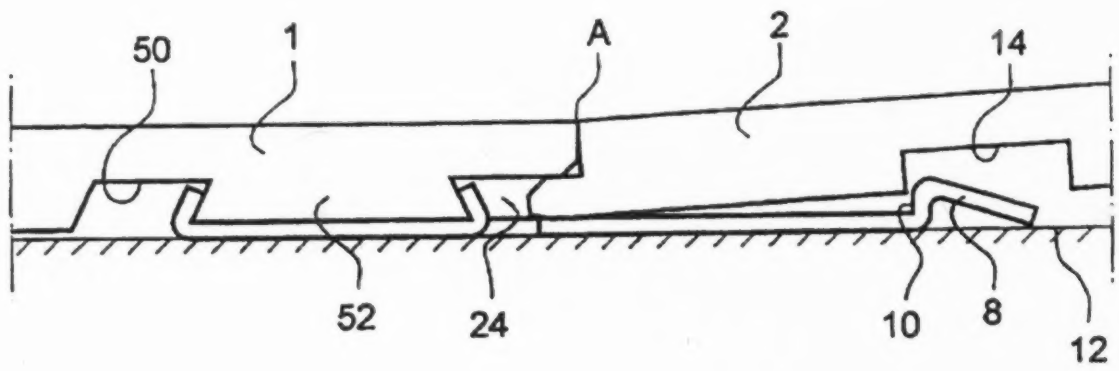


Fig. 2c

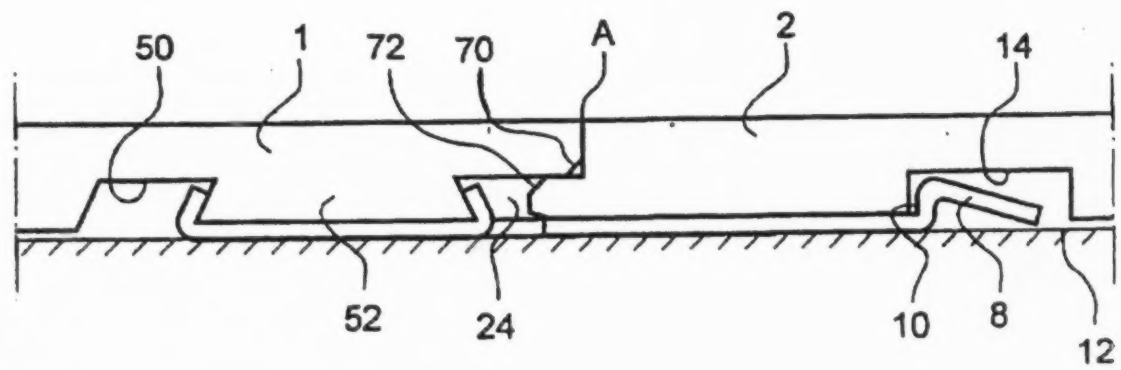


Fig. 3a

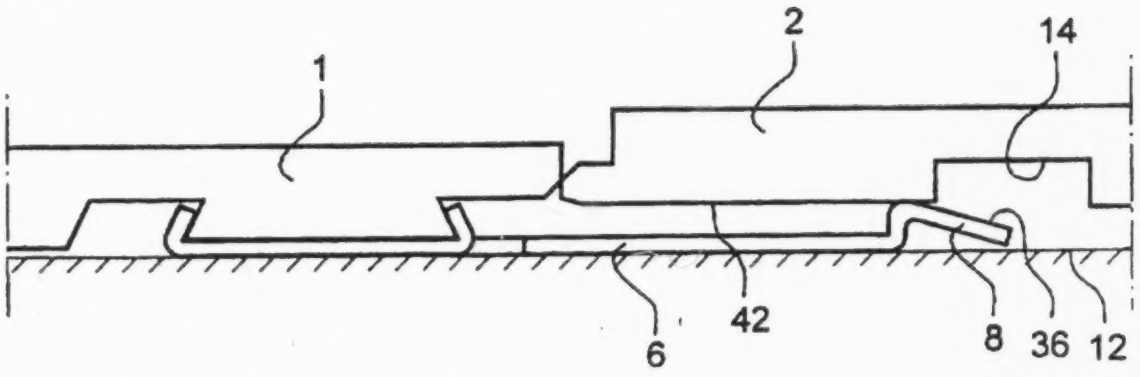


Fig. 3b

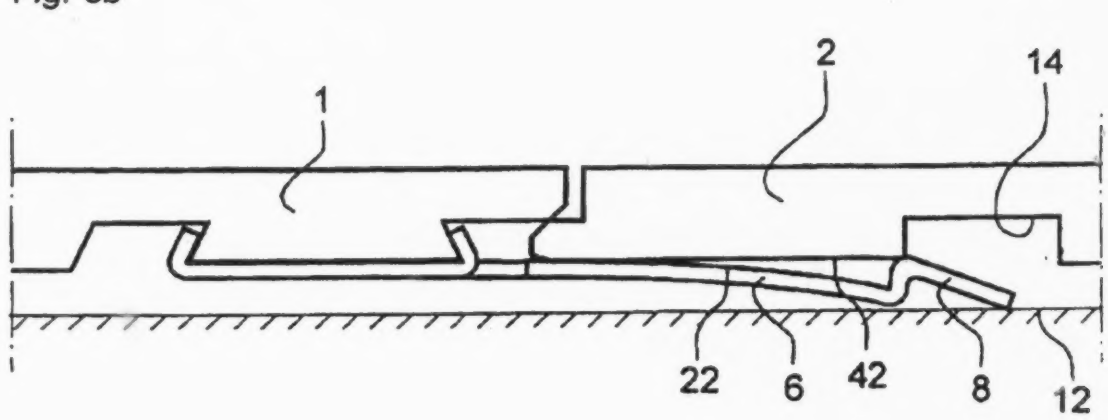


Fig. 3c

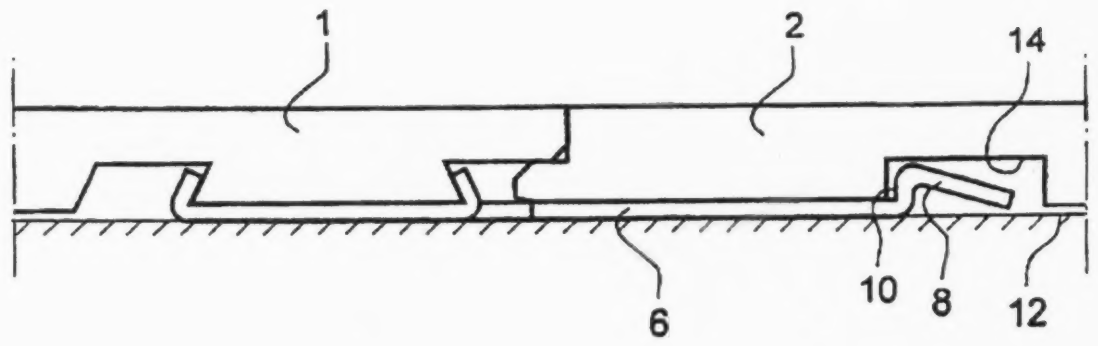


Fig. 4a

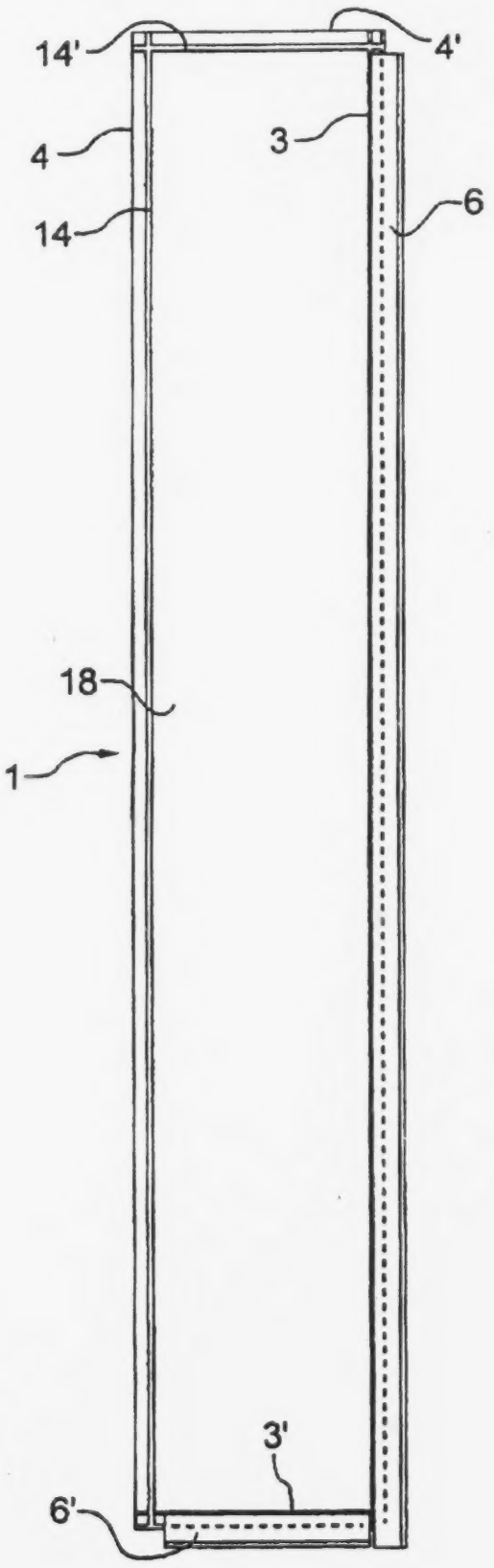
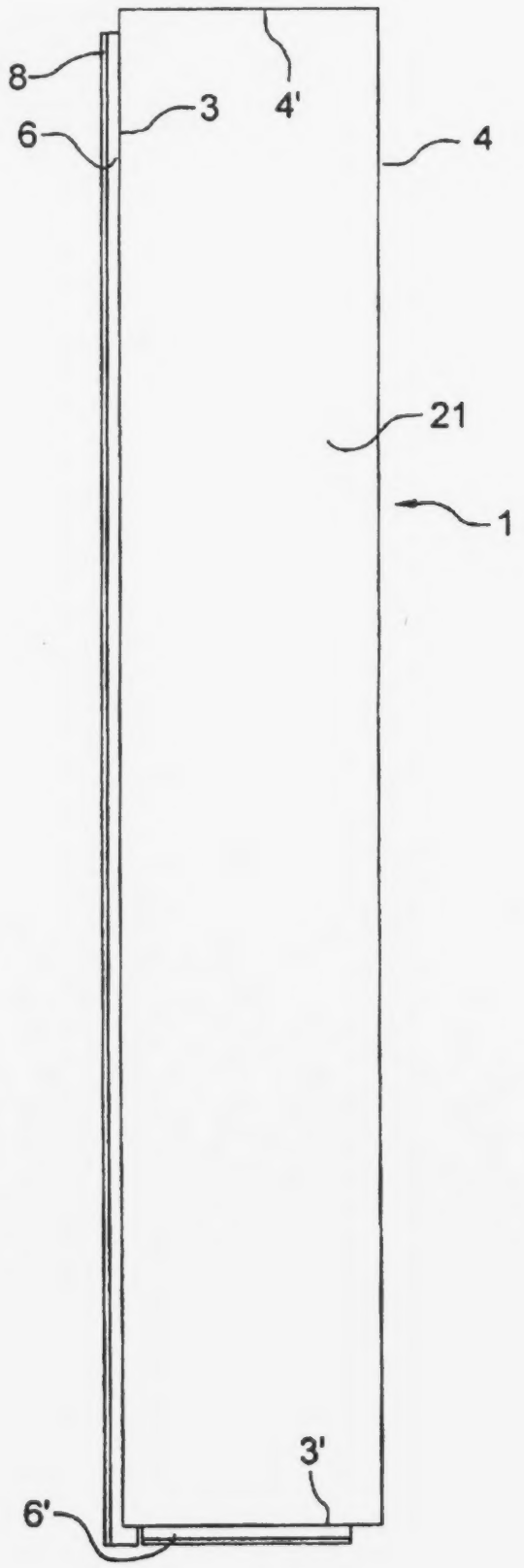


Fig. 4b



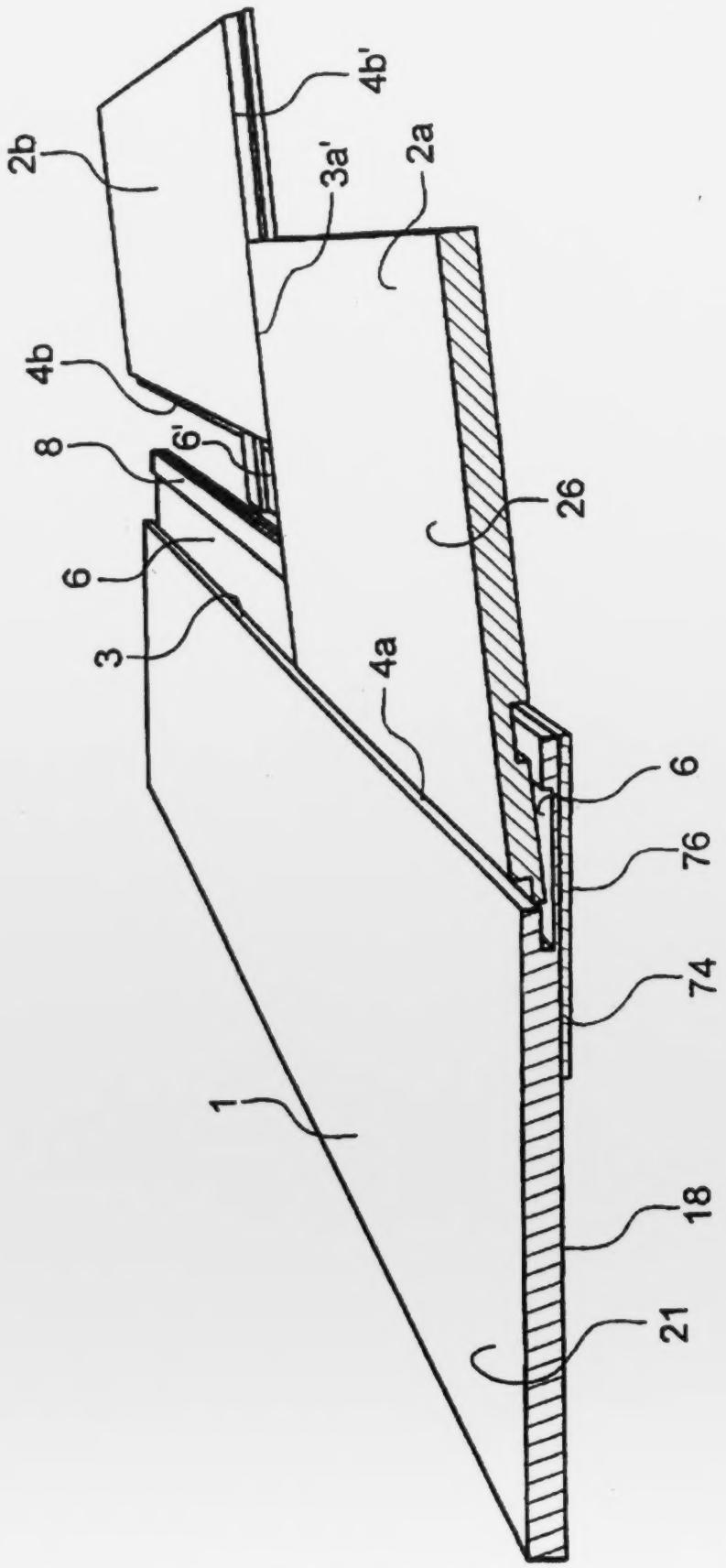


Fig. 5

Fig. 6

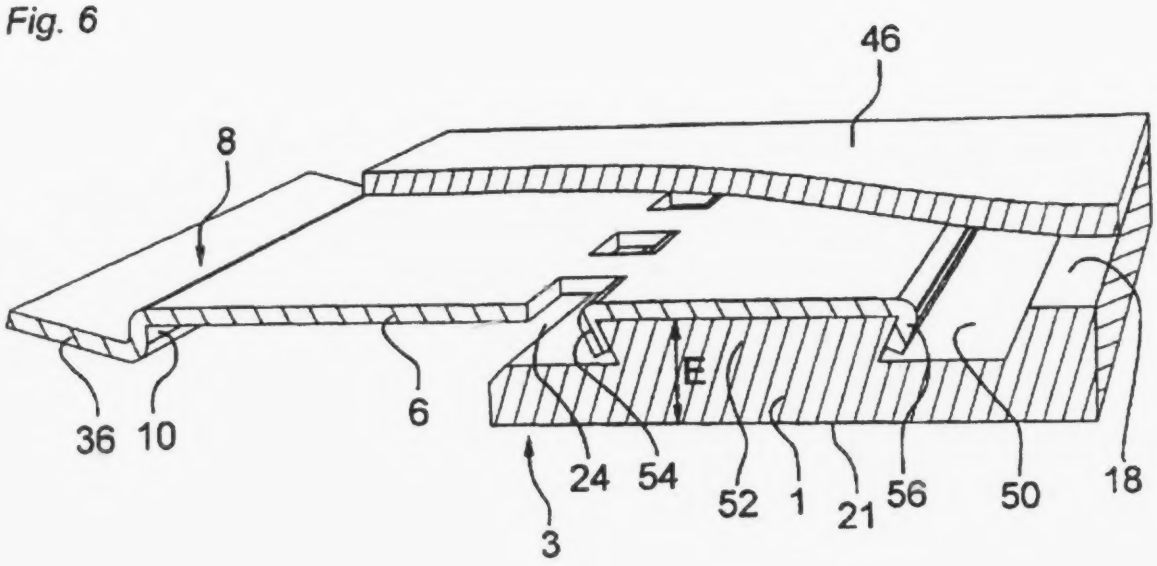
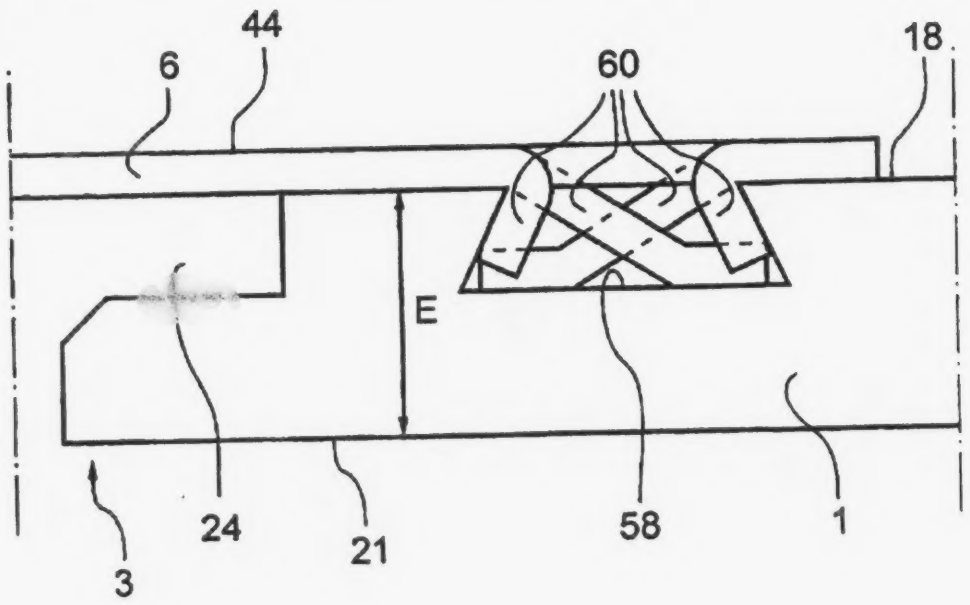


Fig. 7



[1]

SYSTEM FOR JOINING BUILDING BOARDS

TECHNICAL FIELD

The invention generally relates to a system for providing a joint along adjacent joint edges of two building panels,[5] especially floor panels.

More specifically, the joint is of the type where the adjacent joint edges together form a first mechanical connection locking the joint edges to each other in a first direction at fight angles to the principal plane of the panels,[10] and where a locking device forms a second mechanical connection locking the panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges, the locking device comprising a locking groove which extends parallel to and spaced from the joint [15] edge of one of the panels, and said locking groove being open at the rear side of this one panel

The invention is especially well suited for use in joining floor panels, especially thin laminated floors. Thus, the following description of the prior art and of the objects and[20] features of the invention will be focused on this field of use. It should however be emphasised that the invention is useful also for joining ordinary wooden floors as well as other types of building panels, such as wall panels and roof slabs.[25]

BACKGROUND OF THE INVENTION

A joint of the aforementioned type is known e.g. from SE 450,141. The first mechanical connection is achieved by

means of joint edges having tongues and grooves. The locking device for the second mechanical connection comprises [30] two oblique locking grooves, one in the rear side of each panel, and a plurality of spaced-apart spring clips which are distributed along the joint and the legs of which are pressed into the grooves, and which are biased so as to tightly damp the floor panels together. Such a joining [35] technique is especially useful for joining thick floor panels to form surfaces of a considerable expanse.

Thin floor panels of a thickness of about 7-10 mm, especially laminated floors, have in a short time taken a substantial share of the market. All thin floor panels [40] employed are laid as "floating floors" without being attached to the supporting structure. As a rule, the dimension of the floor panels is 200x1200 mm, and their long and short sides are formed with tongues and grooves. Traditionally, the floor [45] is assembled by applying glue in the groove and forcing the floor panels together. The tongue is then glued in the groove of the other panel. As a rule, a laminated floor consists of an upper decorative wear layer of laminate having a thickness of about 1 mm, an intermediate core of particle board or other board, and a base layer to balance the construction [50]. The core has essentially poorer properties than the laminate, e.g. in respect of hardness and water resistance, but it is nonetheless needed primarily for providing a groove and tongue for assemblage. This means that the overall thickness must be at least about 7 mm. These known laminated floors [55] using glued tongue-and-groove joints however suffer from several inconveniences.

First, the requirement of an overall thickness of at least about 7 mm entails an undesirable restraint in connection [60] with the laying of the floor, since it is easier to cope with low thresholds when using thin floor panels, and doors must often be adjusted in height to come clear of the floor laid.

Moreover, manufacturing costs are directly linked with the consumption of material. [65]

Second, the core must be made of moisture-absorbent material to permit using water-based glues when laying the

floor. Therefore, it is not possible to make the floors thinner using so-called compact laminate, because of the absence of suitable gluing methods for such non-moisture-absorbent core materials.

[5] Third, since the laminate layer of the laminated floors is highly wear-resistant, tool wear is a major problem when working the surface in connection with the formation of the tongue.

Fourth, the strength of the joint, based on a glued tongue-[10] and-groove connection, is restricted by the properties of the core and of the glue as well as by the depth and height of the groove. The laying quality is entirely dependent on the gluing. In the event of poor gluing, the joint will open as a result of the tensile stresses which occur e.g. in connection [15] with a change in air humidity.

Fifth, laying a floor with glued tongue-and-groove joints is time-consuming, in that glue must be applied to every panel on both the long and short sides thereof.

Sixth, it is not possible to disassemble a glued floor once [20] laid, without having to break up the joints. Floor panels that have been taken up cannot therefore be used gain. This is a drawback particularly in rental houses where the flat concerned must be put back into the initial state of occupancy. Nor can damaged or worn-out panels be replaced [25] without extensive efforts, which would be particularly desirable on public premises and other areas where parts of the floor are subjected to great wear.

Seventh, known laminated floors are not suited for such use as involves a considerable risk of moisture penetrating [30] down into the moisture-sensitive core.

Eighth, present-day hard, floating floors require, prior to laying the floor panels on hard subfloors, the laying of a separate underlay of floor board, felt, foam or the like, which [35] is to damp impact sounds and to make the floor more pleasant to walk on. The placement of the underlay is a complicated operation, since the underlay must be placed in edge-to-edge fashion. Different under-lays affect the properties of the floor.

[40] There is thus a strongly-felt need to overcome the above-mentioned drawbacks of the prior art. It is however not possible simply to use the known joining technique with glued tongues and grooves for very thin floors, e.g. with floor thicknesses of about 3 mm, since a joint based on a [45] tongue-and-groove connection would not be sufficiently strong and practically impossible to produce for such thin floors. Nor are any other known joining techniques usable for such thin floors. Another reason why the making of thin floors from e.g. compact laminate involves problems is the [50] thickness tolerances of the panels, being about 0.2-0.3 mm for a panel thickness of about 3 mm, A 3-mm compact laminate panel having such a thickness tolerance would have, if ground to uniform thickness on its rear side, an unsymmetrical design, entailing the risk of bulging. [55] Moreover, if the panels have different thicknesses, this also means that the joint will be subjected to excessive load.

Nor is it possible to overcome the above-mentioned problems by using double-adhesive tape or the like on the undersides of the panels, since such a connection catches [60] directly and does not allow for subsequent adjustment of the panels as is The ease with ordinary gluing.

Using U-shaped clips of the type disclosed in the above-mentioned SE 450,141, or similar techniques, to overcome

the drawbacks discussed above is no viable alternative [65] either. Especially, biased clips of this type cannot be used for joining panels of such a small thickness as 3 mm. Normally, it is not possible to disassemble the floor panels without

[3]

having access to their undersides. This known technology relying on clips suffers from the additional drawbacks:

Subsequent adjustment of the panels in their longitudinal direction is a complicated operation in connection with laying, since the clips urge the panels tightly against [5] each other.

Floor laying using clips is time-consuming.

This technique is usable only in those cases where the floor panels are resting on underlying joists with the clips placed therebetween. For thin floors to be laid on [10] a continuous, flat supporting structure, such clips cannot be used.

The floor panels can be joined together only at their long sides. No clip connection is provided on the short sides. [15]

Technical Problems and Objects of the Invention

A main object of the invention therefore is to provide a system for joining together building panels, especially floor panels for hard, floating floors, which allows using floor panels of a smaller overall thickness than present-day floor [20] panels.

A particular object of the invention is to provide a panel-joining system which

makes it possible in a simple, cheap and rational way to provide a joint between floor panels without requiring [25] the use of glue, especially a joint based primarily only on mechanical connections between the panels;

can be used for joining floor panels which have a smaller thickness than present-day laminated floors and which have, because of the use of a different core material superior properties than present-day floors even at a thickness of 3 mm;

makes it possible between thin floor panels to provide a joint that eliminates any unevennesses in the joint because of thickness tolerances of the panels; [35]

allows joining all the edges of the panels;

reduces tool wear when manufacturing floor panels with hard surface layers;

allows repeated disassembly and reassembly of a floor [40] previously laid, without causing damage to the panels, while ensuring high laying quality;

makes it possible to provide moisture-proof floors;

makes it possible to obviate the need of accurate, separate placement of an underlay before laying the floor panels; and

considerably cuts the time for joining the panels.

These and other objects of the invention are achieved by means of a panel-joining system having the features recited [50] in the appended claims.

Thus, the invention provides a system for making a joint along adjacent joint edges of two building panels, especially floor panels, in which joint:

the adjacent joint edges together form a first mechanical [55] connection locking the joint edges to each other in a first direction at fight angles to the principal plane of the panels, and

a locking device arranged on the rear side of the panels forms a second mechanical connection locking the [60] panels to each other in a second direction parallel to the principal plane and at right angles to the joint edges, said locking device comprising a locking groove which extends parallel to and spaced from the

joint edge of one of said panels, termed groove panel, and which is [65] open at the rear side of the groove panel, said system being characterised in

[4]

that the locking device further comprises a strip integrated with the other of said panels, termed strip panel, said strip extending throughout substantially the entire length of the joint edge of the strip panel and being [5] provided with a locking element projecting from the strip, such that when the panels are joined together, the strip projects on the rear side of the groove panel with its locking element received in the locking groove of the groove panel,

[10] that the panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking clement that is facing the joint edges and is operative in said second mechanical connection,

[15] that the first and the second mechanical connection both allow mutual displacement of the panels in the direction of the joint edges, and

that the second mechanical connection is so conceived as to allow the locking element to leave the locking [20] groove ff the groove panel is turned about its joint edge angularly away from the strip.

The term "rear side" as used above should be considered to comprise any side of the panel located behind/underneath the front side of the panel. The opening plane of the locking [25] groove of the groove panel can thus be located at a distance from the rear surface of the panel resting on the supporting structure. Moreover, the strip, which in the invention extends throughout substantially the entire length of

the joint edge of the strip panel should be considered to encompass [30] both the case where the strip is a continuous, uninterrupted element, and the case where the "strip" consists in its longitudinal direction of several parts, together covering the main portion of the joint edge.

It should also be noted (i) that it is the first and the second [35] mechanical connection as such that permit mutual displacement of the panels in the direction of the joint edges, and that (ii) it is the second mechanical connection as such that permits the looking element to leave the locking groove if the groove panel is turned about its joint edge angularly [40] away from the strip. Within the scope of the invention, there may thus exist means, such as glue and mechanical devices, that can counteract or prevent such displacement and/or upward angling.

The system according to the invention makes it possible [45] to provide concealed, precise locking of both the short and long sides of the panels in hard, thin floors. The floor panels can be quickly and conveniently disassembled in the reverse order of laying without any risk of damage to the panels, ensuring at the same time a high laying quality. The panels [50] can be assembled and disassembled much faster than in present-day systems, and any damaged or worn-out panels can be replaced by taking up and re-laying parts of the floor.

According to an especially preferred embodiment of the invention, a system is provided which permits precise joining [55] of thin floor panels having, for example, a thickness of the order of 3 mm and which at the same time provides a tolerance-independent smooth top face at the joint. To this end, the strip is mounted in an equalising groove which is countersunk in the rear side of the strip panel and which [60] exhibits an exact, predetermined distance from its bottom to the front side of the strip panel. The part of the strip projecting behind the groove panel engages a corresponding

equalising groove, which is countersunk in the rear side of the groove panel and which exhibits The same exact, predetermined [65] distance from its bottom to the front side of the groove panel. The thickness of the strip then is at least so great that the rear side of the strip is flush with, and

[5]

preferably projects slightly below the rear side of the panels. In this embodiment, the panels will always rest, in the joint, with their equalising grooves on a strip. This levels out the tolerance and imparts the necessary strength to the joint. The strip transmits horizontal and upwardly-directed forces to [5] the panels and down-wardly-directed forces to the existing subfloor.

Preferably, the strip may consist of a material which is flexible, resilient and strong, and can be sawn. A preferred strip material is sheet aluminium. In an aluminium strip,[10] sufficient strength can be achieved with a strip thickness of the order of 0.5 mm.

In order to permit taking up previously laid, joined floor panels in a simple way, a preferred embodiment of the invention is characterised in that when the groove panel is[15] pressed against the strip panel in the second direction and is mined angularly away from the strip, the maximum distance between the axis of rotation of the groove panel and the locking surface of the locking groove closest to the joint edges is such that the locking element can leave the locking groove[20] without contacting the locking surface of the locking groove. Such a disassembly can be achieved even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm.

According to the invention, the locking surface of the[25] locking element is able to provide a sufficient locking function even with very small heights of the locking surface. Efficient

locking of 3-mm floor panels can be achieved with a locking surface that is as low as 2 mm. Even a 0.5-mm-high locking surface may provide sufficient locking. The [30] term "locking surface" as used herein relates to the part of the locking element engaging the locking groove to form the second mechanical connection.

For optimal function of the invention, the strip and the locking element should be formed on the strip panel with [35] high precision. Especially, the locking surface of the locking element should be located at an exact distance from the joint edge of the strip panel.

Furthermore, the extent of the engagement in the floor panels should be minimised, since it reduces the floor [40] strength.

By known manufacturing methods, it is possible to produce a strip with a locking pin, for example by extruding ahuninium or plastics into a suitable section, which is thereafter glued to the floor panel or is inserted in special [40] grooves. These and all other traditional methods do however not ensure optimum function and an optimum level of economy. To produce the joint system according to the invention, the strip is suitably formed from sheet aluminium, and is mechanically fixed to the strip panel. [50]

The laying of the panels can be performed by first placing the strip panel on the subfloor and then moving the groove panel with its long side up to the long side of the strip panel, at an angle between the principal plane of the groove panel and the subfloor. When the joint edges have been brought [55] into engagement with each other to form the first mechanical connection, the groove panel is angled down so as to accommodate the locking element in the locking groove.

Laying can also be performed by first placing both the strip panel and the groove panel flat on the subfloor and then [60] joining the panels parallel to their principal planes while bending the strip downwards until the locking element snaps

up into the locking groove. This laying technique enables in particular mechanical locking of both the short and long sides of the floor panels. For example, the long sides can be [65] joined together by using the first laying technique with downward angling of the groove panel, while the short sides

[6]

are subsequently joined together by displacing the groove panel in its longitudinal direction until its short side is pressed on and locked to the short side of an adjacent panel in the same row.

[5] In connection with their manufacture, the floor panels can be provided with an underlay of e.g. floor board, foam or felt. The underlay should preferably cover the strip such that the joint between the underlays is offset in relation to the joint between the floor panels.

[10] The above and other features and advantages of the invention will appear from The appended claims and the following description of embodiments of the invention.

The invention will now be described in more detail hereinbelow with reference to the accompanying drawing [15] Figures.

DESCRIPTION OF DRAWING FIGURES

FIGS. **1***a* and **1***b* schematically show in two stages how two floor panels of different thickness are joined together in [20] floating fashion according to a first embodiment of the invention.

FIGS. **2***a-c* show in three stages a method for mechanically joining two floor panels according to a second embodiment of the invention.

[25] FIGS. **3***a-c* show in three stages another method for mechanically joining the floor panels of FIGS. **2***a-c*.

FIGS. **4***a* and **4***b* show a floor panel according to FIGS. **2***a-c* as seen from below and from above, respectively.

[30] FIG. **5** illustrates in perspective a method for laying and joining floor panels according to a third embodiment of the invention.

FIG. **6** shows in perspective and from below a first variant for mounting a strip on a floor panel.

[35] FIG. **7** shows in section a second variant for mounting a strip on a floor panel.

DESCRIPTION OF PREFERRED EMBODIMENTS

[40] FIGS. **1***a* and **1***b*, to which reference is now made, illustrate a first floor panel **1**, hereinafter termed strip panel, and a second floor panel **2**, hereinafter termed groove panel. The terms "strip panel" and "groove panel" are merely intended to facilitate the description of the invention, the [45] panels **1**, **2** normally being identical in practice. The panels **1** and **2** may be made from compact laminate and may have a thickness of about 3 mm with a thickness tolerance of about $\pm$0.2 mm. Considering this thickness tolerance, the [50] panels **1**, **2** are illustrated with different Thicknesses (FIG. **1***b*), the strip panel **1** having a maximum thickness (3.2 mm) and the groove panel **2** having a minimum thickness (2.8 mm).

To enable mechanical joining of the panels **1**, **2** at [55] opposing joint edges, generally designated **3** and **4**, respectively, the panels are provided with grooves and strips as described in the following.

Reference is now made primarily to FIGS. **1***a* and **1***b*, and secondly to FIGS. **4***a* and **4***b* showing the basic design of the [60] floor panels from below and from above, respectively.

From the joint edge **3** of the strip panel **1**, i.e. the one long side, projects horizontally a flat strip **6** mounted at the

factory on the underside of the strip panel **1** and extending throughout the entire joint edge **3**. The strip **6**, which is made [65] of flexible, resilient sheet aluminium, can be fixed mechanically, by means of glue or in any other suitable way. In FIGS. **1***a* and **1***b*. the strip **6** is glued, while in FIGS. **4***a*

[7]

and **4***b* it is mounted by means of a mechanical connection, which will be described in more detail hereinbelow.

Other strip materials can be used, such as sheets of other metals, as well as aluminium or plastics sections. Alternatively, the strip **6** may be integrally formed with the [5] strip panel **1**. At any rate, the strip **6** should be integrated with the strip panel **1**, i.e. it should not be mounted on the strip panel **1** in connection with laying. As a non-restrictive example, the strip **6** may have a width of about 30 mm and a thickness of about 0.5 mm. [10]

As appears from FIGS. **4***a* and **4***b*, a similar, although shorter strip **6'** is provided also at one short side **3'** of the strip panel **1**. The shorter strip **6'** does however not extend throughout the entire short side **3'** but is otherwise identical with the strip **6** and, therefore, is not described in more detail [15] here.

The edge of the strip **6** facing away from the joint edge **3** is formed with a locking element **8** extended throughout The entire strip **6**. The locking element **8** has a locking surface **10** facing the joint edge **3** and having a height of e.g. 0.5 mm. [20] The locking element **8** is so designed that when the floor is being laid and the strip panel **2** of FIG. **1***a* is pressed with its joint edge **4** against the joint edge **3** of the strip panel **1** and is angled down against the subfloor **12** according to FIG. **1***b*, [25] it enters a locking groove **14** formed in the underside of the groove panel **2** and extending parallel to and spaced from the joint edge **4**. In FIG. **1***b*, the locking element **8** and the

locking groove **14** together form a mechanical connection locking the panels **1**, **2** to each other in the direction designated D2. More specifically, the locking surface **10** of the locking element **8** serves as a stop with respect to the surface of the locking groove **14** closest to the joint edge **4**.

When the panels **1** and **2** are joined together, they can however occupy such a relative position in the direction D2 that there is a small play Δ between the locking surface **10** and the locking groove **14**. This mechanical connection in the direction D2 allows mutual displacement of the panels **1**, **2** in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action. [40]

As appears from FIGS. **4***a* and **4***b*, each panel in the system has a strip **6** at one long side **3** and a locking groove **14** at the other long side **4**, as well as a strip at one short side **3'** and a locking groove **14'** at the other short side **4'**. [45]

Furthermore, the joint edge **3** of the strip panel **1** has in its underside **18** a recess **20** extending throughout the entire joint edge **3** and forming together with the upper face **22** of the strip **6** a laterally open recess **24**. The joint edge **4** of the groove panel **2** has in its top side **26** a corresponding recess [50] **28** forming a locking tongue **30** to be accommodated in the recess **24** so as to form a mechanical connection locking the joint edges **3**, **4** to each other in the direction designated D1. This connection can be achieved with other designs of the joint edges **3**, **4**, for example by a bevel the thereof such that [55] the joint edge **4** of the groove panel **2** passes obliquely in underneath the joint edge **3** of the strip panel **1** to be locked between that edge and the snip **6**.

The panels **1**, **2** can be taken up in the reverse order of laying without causing any damage to the joint, and be laid again.

The strip **6** is mounted in a tolerance-equalizing groove **40** in the underside **18** of the strip panel **1** adjacent the joint edge

3. In this embodiment, the width of the equalizing groove **40** is approximately equal to half the width of the strip **6**, i.e. about 15 mm. By means of the equalizing groove **40**, it is ensured that there will always exist between the top

[8]

side **21** of the panel **1** and the bottom of the groove **40** an exact, predetermined distance E which is slightly smaller than the minimum thickness (2.8 mm) of the floor panels **1, 2.** The groove panel **2** has a corresponding tolerance-[5] equalising surface or groove **42** in the underside **16** of the joint edge **4**. The distance between the equalizing surface **42** and the top side **26** of the groove panel **2** is equal to the aforementioned exact distance E. Further, the thickness of the strip **6** is so chosen that the underside **44** of the strip is [10] situated slightly below the undersides **18** and **16** of the floor panels **1** and **2**, respectively. In this manner, the entire joint will rest on the strip **6**, and all vertical downwardly-directed forces will be efficiently transmitted to the subfloor **12** without any stresses being exerted on the joint edges **3**, **4**. Thanks to the provision of the equalizing grooves **40**, **42**, an [15] entirely even joint will be achieved on the top side, despite the thickness tolerances of the panels **1**, **2**, without having to perform any grinding or the like across the whole panels. Especially, this obviates the risk of damage to the bottom layer of the compact laminate, which might give rise to [20] bulging of the panels.

Reference is now made to the embodiment of FIGS. **2***a-c* showing in a succession substantially the same laying method as in FIGS. **1***a* and **1***b*. The embodiment of FIGS. **2***a-c* primarily differs from the embodiment of FIGS. **1***a* and [25] **1***b* in that the strip **6** is mounted on the strip panel **1** by means of a mechanical connection instead of glue. To provide this mechanical connection, illustrated in more detail in FIG. **6**, a

groove **50** is provided in the underside **18** of the strip panel **1** at a distance from the recess **24**. The groove **50** may be formed either as a continuous groove extending throughout [30] the entire length of the panel **1**, or as a number of separate grooves. The groove **50** defines, together with the recess **24**, a dovetail gripping edge **52**, the underside of which exhibits an exact equalizing distance E to the top side **21** of the strip [35] panel **1**. The aluminium strip **6** has a number of punched and bent tongues **54**, as well as one or more lips **56** which are bent round opposite sides of the gripping edge **52** in clamping engagement therewith. This connection is shown in detail from below in the perspective view of FIG. **6**.

[40] Alternatively, a mechanical connection between the strip **6** and the strip panel **1** can be provided as illustrated in FIG. **7** showing in section a cut-away part of the strip panel **1** turned upside down. In FIG. **7**, the mechanical connection comprises a dovetail recess **58** in the underside **18** of the [45] strip panel **1**, as well as tongues/lips **60** punched and bent from the strip **5** and clamping against opposing inner sides of the recess **58**.

The embodiment of FIGS. **2***a-c* is further characterized in that the locking element **8** of the strip **6** is designed as a [50] component bent from the aluminium sheet and having an operative locking surface **10** extending at right angles up from the front side **22** of the strip **6** through a height of e.g. 0.5 mm, and a rounded guide surface **34** facilitating the insertion of the locking element **8** into the locking groove **14** [55] when angling down the groove panel **2** towards The subfloor **12** (FIG. **2***b*), as well as a portion **36** which is inclined towards the subfloor **12** and which is not operative in the laying method illustrated in FIGS. **2***a-c*.

Further, it can be seen from FIGS. **2***a-c* that the joint edge [60] **3** of the strip panel **1** has a lower bevel **70** which cooperates during laying with a corresponding upper bevel **72** of the joint edge **4** of the groove panel **2**, such that the panels

1 and **2** are forced to move vertically towards each other when their joint edges **3**, **4** are moved up to each other and the [65] panels are pressed together horizontally.

Preferably, the locking surface **10** is so located relative to the joint edge **3** that when the groove panel **2**, starting from

[9]

the joined position in FIG. **2***c*, is pressed horizontally in the direction D2 against the strip panel **1** and is turned angularly up from the strip **6**, the maximum distance between the axis of rotation A of the groove panel **2** and the locking surface **10** of the locking groove is such that the locking element **8** [5] can leave The locking groove **14** without coming into contact with it.

FIGS. **3***a*-**3***b* show another joining method for mechanically joining together the floor panels of FIGS. **2***a*-*c*. The method illustrated in FIGS. **3***a*-*c* relies on the fact that the [10] strip **6** is resilient and is especially useful for joining together the short sides of floor panels which have already been joined along one long side as illustrated in FIGS. **2***a*-*c*. The method of FIGS. **3***a*-*c* is performed by first placing the two panels **1** and **2** flat on the subfloor **12** and then moving them horizontally towards each other according to FIG. **3***b*. The [15] inclined portion **36** of the locking element **8** then serves as a guide surface which guides the joint edge **4** of the groove panel **2** up on to the upper side **22** of the strip **6**. The strip **6** will then be urged downwards while the locking element [20] **8** is sliding on the equalizing surface **42**. When the joint edges **3**, **4** have been brought into complete engagement with each other horizontally, the locking element **8** will snap into the locking groove **14** (FIG. **3***c*), thereby providing the same locking as in FIG. **2***c*. The same locking method can [25] also be used by placing, in the initial position, the joint edge 4 of the groove panel with the

equalizing groove **42** on the locking element **10** (FIG. 3*a*). The inclined portion **36** of the locking element **10** then is not operative. This technique thus makes it possible to lock the floor panels mechanically in all [30] directions, and by repeating the laying operations the whole floor can be laid without using any glue.

The invention is not restricted to the preferred embodiments described above and illustrated in the drawings, but several variants and modifications thereof are conceivable [35] within the scope of the appended claims. The strip **6** can be divided into small sections coveting the major part of the joint length. Further, the thickness of the strip **6** may vary throughout its width. All strips, locking grooves, locking elements and recesses are so dimensioned as to enable [40] laying the floor panels with flat top sides in a manner to rest on the strip **6** in the joint. If the floor panels consist of compact laminate and if silicone or any other sealing compound, a rubber strip or any other scaling device is applied prior to laying between the flat projecting part of the [45] strip **6** and the groove panel **2** and/or in the recess **26**, a moisture-proof floor is obtained.

As appears from FIG. **6**, an underlay **46**, e.g of floor board, foam or felt, can be mounted on the underside of the panels during the manufacture thereof. In one embodiment, [50] the underlay **45** covers the strip **6** up to the locking element **8**, such that the joint between the underlays **46** becomes offset in relation to the joint between the joint edges **3** and **4**.

In the embodiment of FIG. **5**, the strip **6** and its locking [55] element **8** are integrally formed with the strip panel **1**, the projecting part of the strip **6** thus forming an extension of the lower part of the joint edge **3**. The locking function is the same as in the embodiments described above. On the underside **18** of the strip panel **1**, there is provided a separate strip [60], band or the like **74** extending throughout the entire

length of the joint and having, in this embodiment, a width covering approximately the same surface as the separate strip **6** of the previous embodiments. The strip **74** can be provided in directly on the rear side **18** or in a recess formed therein (not [65] shown), so that the distance from the front side **21**, **26** of the floor to the rear side **76**, including the thickness of the strip

[10]

74, always is at least equal to the corresponding distance in the panel having the greatest thickness tolerance. The panels **1**, **2** will then rest, in the joint, on the strip **74** or only on the undersides **18**, **16** of the panels, if these sides are made [5] plane.

When using a material which does not permit downward bending of the strip **6** or the locking element **8**, laying can be performed in the way shown in FIG. **5**. A floor panel **2***a* is moved angled upwardly with its long side **4**a into engage-[10] ment with the long side **3** of a previously laid floor panel **1** while at the same time a third floor panel **2***b* is moved with its short side **4***b*' into engagement with the short side **3***a*' of the upwardly-angled floor panel **2***a* and is fastened by angling the panel **2***b* downwards. The panel **2***b* is then pushed along the short side **3***a*' of the upwardly-angled floor [15] panel **2***a* until its long side **4***b* encounters the long side **3** of The initially-laid panel **1**. The two upwardly-angled panels **2***a* and **2***b* are therefore angled down on to the subfloor **12** so as to bring about locking.

By a reverse procedure the panels can be taken up in The [20] reverse order of laying without causing any damage to the joint, and be laid again.

Several variants of preferred laying methods are conceivable. For example, the strip panel can be inserted

under the groove panel, thus enabling the laying of panels in all four [25] directions with respect to the initial position.

What is claimed:

1. A system for providing a joint between adjacent building panels, comprising:

each of said building panels including a first edge and a [30] second edge such that the first edge of each of said building panels forms a first mechanical connection with the second edge of an adjacent one of the building panels locking the first and second edges of the building panels to each other in a first direction at right [35] angles to a principal plane of the panels, and

a locking device arranged on a rear side of the building panels forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right [40] angles to the first and second edges, said locking device fitting within a locking groove extending parallel to and spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the [45] building panels,

the locking device comprising a strip integrated with the second edge of each of said budding panels, said strip extending throughout substantially an entire length of the second edge and being provided with a locking [50] element projecting from the strip, such that when two adjacent building panels are joined together, the strip projects from the rear side of the second edge of the panels with its locking element received in the locking groove of an adjacent building panel,

[55] the building panels, when joined together, can occupy a relative position in said second direction where a play exists between the locking groove and a locking surface on the locking element that is facing

the first and second edges and is operative in said second mechanical connection, [60]

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the first and second edges, and

the second mechanical connection enables the locking [65]element to leave the locking groove if the respective building panel is turned about its first edge angularly away from the strip.

[11]

2. A system as claimed in claim **1**, wherein when the first edge is pressed against the second edge of the adjacent panel in said second direction and is turned angularly away from the strip, the maximum distance between the axis of rotation of the first edge and the locking surface of the locking groove[5] closest to the first and second edges is such that the locking element can leave the locking groove without contacting the locking surface of the locking groove.

3. A system as claimed in claim **1** wherein, the locking surface of the locking element (**22**) is extended from a front[10] side (**22**) of the strip through a height in said first direction that is less than or equal to 2 mm.

4. A system as claimed in claim **1**, wherein the first mechanical connection is provided by the first edge engaging, in said first direction, between the second edge of [15] the adjacent panel and a front side of the strip.

5. A system as claimed in claim **1**, wherein the strip is made of a material different from that of the panel and fixedly mounted on the panel at the factory.

6. A system as claimed in claim **5**, wherein the strip (**6**), [20] at least for one of the two panels, is received in a counter-sunk groove in the rear side of this one panel.

7. A system as claimed in claim 5, wherein the strip is mounted in an equalising groove which is countersunk in the rear side of the panel and exhibits an [25] exact, predetermined distance from its bottom to the front side of the panel,

the part of the strip projecting behind the adjacent panel engages a corresponding equalising groove which is countersunk in the rear side of the adjacent panel and [30] which exhibits the same exact, predetermined distance from its bottom to the front side of the adjacent panel, and

the strip has at least such a thickness that the rear side of the strip is flush with the rear sides of the panels. [35]

8. A system as claimed in claim 7, wherein the strip has such a thickness that it is only partly received in the equalising grooves.

9. A system as claimed in claim 5, wherein the strip is fixed to the strip panel by means of a mechanical connection.[40]

10. A system as claimed in claim 9, wherein the mechanical connection between the strip and the panel comprises a gripping edge defined by two recesses in the rear side of the panel, and tongues, lips or the like which are bent or punched from the strip and which press against opposite[45] outer sides of the gripping edge.

11. A system as claimed in claim 9, wherein the mechanical connection between the strip and the panel comprises a recess in the rear side of the panel, and tongues, lips or the like which are bent or punched from the strip and which [50] press against opposing inner sides of the recess.

12. A system as claimed in claim 5, wherein the strip is fixed to the panel by means of a binder.

13. A system as claimed in claim 5, wherein the strip is made of a flexible, preferably resilient material, such as [55] sheet aluminum.

14. A system as claimed in claim **1**, wherein the locking element consists of a locking edge extended continuously along the strip.

15. A system as claimed in claim **1**, wherein the locking[60] element consists of a plurality of spaced-apart locking elements distributed throughout the length of the strip.

16. A system as claimed in claim **1**, wherein the panels are rectangular and intended, at each of their four edges, to be joined to a similar panel by a first mechanical connection of the aforementioned type and a second mechanical connection of the aforementioned type, each panel having a first

[12]

pair of first and second edges, one of which is provided with a strip of the aforementioned type and the other of which is provided with a locking groove of the aforementioned type, and a second pair of opposite first and second edges, one of [5] which is provided with a strip of the aforementioned type and the other of which is provided with a locking groove of the aforementioned type.

17. A system as claimed in claim **1**, wherein an underlay of floor boards, foam, felt or the like is fixed to the rear sides [10] of the panels.

18. A system as claimed in claim **17**, wherein the underlay is fixed so as to cover the strip in said second direction at least up to the locking element, such that a joint between the underlays of the two adjacent panels is offset in said second direction relative to the first and second edges.

[15] **19**. A system as claimed in any one of the preceding claims, wherein a sealing means, such as a sealing compound, a rubber strip or the like, is provided on the front side of the strip between the locking element and the first edge of the strip panel to seal against the adjacent panel.

[20] **20**. A system as claimed in claim **2**, wherein the locking surface of the locking element is extended from the front side of the strip through a height in said first direction that is less than or equal to 2 mm.

21. A system for providing a joint between adjacent [25] building panels, comprising:

each of said building panels including a first edge and a second edge such that the first edge of each of said building panels forms a first mechanical connection [30] with the second edge of an adjacent one of the building panels locking the first and second edges of the building panels to each other in a first direction at fight angles to a principal plane of the panels, and

a locking device arranged on a rear side of the building panels forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right angles to the first and second edges, said locking device fitting within a locking groove extending parallel to and [40] spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the building panels,

the locking device comprising a strip integrally formed with the second edge of each of said building panels, [45] said strip extending throughout substantially an entire length of the second edge and being provided with a locking element projecting from the strip, such that when two adjacent building panels are joined together, the strip projects from the rear side of the second edge [50] of the panels with its locking element received in the locking groove of an adjacent building panel,

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the first and second edges, and

[55] the second mechanical connection enables the locking element to leave the locking groove if the respective building panel is turned about its first edge angularly away from the strip.

22. A system for providing a joint between adjacent [60] building panels, comprising:

each of said building panels including a first edge and a second edge such that the first edge of each of said building panels forms a first mechanical connection with the second edge of an adjacent one of the building [65] panels locking the first and second edges of the building panels to each other in a first direction at right angles to a principal plane of the panels, and

[13]

a locking device arranged on a rear side of the building panels forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right angles to the first and second edges, said locking device [5] fitting within a locking groove extending parallel to and spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the building panels,

the locking device comprising a strip integrated with the[10] second edge of each of said building panels, said strip extending throughout substantially an entire length of the second edge and being provided with a locking element projecting from the strip, such that when two adjacent building panels are joined together, the strip [15] projects from the rear side of the second edge of the panels with its locking element received in the locking groove of an adjacent building panel,

the first and the second mechanical connections both allow mutual displacement of the building panels in a [20] direction of the first and second edges, and

the second mechanical connection enables the locking element to leave the locking groove if the respective building panel is turned about its first edge angularly [25] away from the strip.

23. A system for providing a joint between adjacent building panels, comprising:

each of said building panels including a first edge and a second edge such that the first edge of each of said [30] building panels forms a first mechanical connection with the second edge of an adjacent one of the building panels locking the first and second edges of the building panels to each other in a first direction at right angles to a principal plane of the panels, and [35]

a locking device arranged on a rear side of the building panels forming a second mechanical connection lock-

[14]

ing the building panels to each other in a second direction parallel to the principal plane and at right angles to the first and second edges, said locking device fitting within a locking groove extending parallel to and [5] spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the building panels,

the locking device comprising a strip integrated with the second edge of each of said building panels, said strip [10] being provided with a locking element projecting from the strip, such that when two adjacent building panels are joined together, the strip projects from the rear side of the second edge of the panels with its

locking element received in the locking groove of an adjacent [15]building panel,

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the first and second edges, and

the second mechanical connection enables the locking [20] element to leave the locking groove if the respective building panel is turned about its first edge angularly away from the strip;

wherein the strip is mounted in an equalizing groove [25] which is countersunk in the rear side of each of the building panels and exhibits an exact, predetermined distance from its bottom to the front side of the panel,

the part of the strip projecting behind the adjacent panel engages a corresponding equalising groove which is countersunk in the rear side of the adjacent panel and which exhibits the same exact, predetermined distance from its bottom to the front side of the adjacent panel, and

the strip has at least such a thickness that the rear side of the strip is flush with the rear sides of the panels.

* * * * *

APPENDIX I

Patent Application Serial No. 08/436224

U.S. Department of Commerce
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Fee Record Sheet

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Fold Out Exhibit

PCT Application
Claims
and
Examiner's Action

EDITOR'S NOTE

THE FOLLOWING PAGES WERE POOR HARD COPY AT THE TIME OF FILMING. IF AND WHEN A BETTER COPY CAN BE OBTAINED, A NEW FICHE WILL BE ISSUED.

What is claimed:

1. A system for providing a joint along adjacent joint edges (3, 4) of two building panels (1, 2), especially floor panels, in which joint:

the adjacent joint edges (3, 4) together form a first mechanical connection locking the joint edges (3, 4) to each other in a first direction (D1) at right angles to the principal plane of the panels (1, 2), and

a locking device (6, 8, 14) arranged on the rear side (18, 16) of the panels (1, 2) forms a second mechanical connection locking the panels (1, 2) to each other in a second direction (D2) parallel to the principal plane and at right angles to the joint edges (3, 4), said locking device (6, 8, 14) comprising a locking groove (14) which extends parallel to and spaced from the joint edge (4) of one (2) of said panels, termed groove panel, and which is open at the rear side (16) of the groove panel (2), characterised in

that the locking device (6, 8, 14) further comprises a strip (6) integrated with the other (1) of said panels, termed strip panel, said strip (6) extending throughout substantially the entire length of the joint edge (3) of the strip panel (1) and being provided with a locking element (8) projecting from the strip, such that when the panels are joined together, the strip (6) projects on the rear side of the groove panel (2) with its locking element (8) received in the locking groove (14) of the groove panel (2),

that the panels, when joined together, can occupy a relative position in said second direction (D2) where a play (A) exists between the locking groove (14) and a locking surface (10) on the locking element (8) that is facing the joint edges and is operative in said second ~~mechanical connection~~

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that the first and the second mechanical connection both allow mutual displacement of the panels (1, 2) in the direction of the joint edges (3, 4), and

that the second mechanical connection is so conceived as to allow the locking element (8) to leave the locking groove (14) if the groove panel (2) is turned about its joint edge (3) angularly away from the strip (6).

2. A system as claimed in claim 1, wherein ~~characterized in that~~ when the groove panel (2) is pressed against the strip panel (1) in said second direction (D2) and is turned angularly away from the strip (6), the maximum distance between the axis of rotation of the groove panel (2) and the locking surface of the locking groove (14) closest to the joint edges is such that the locking element (8) can leave the locking groove (14) without contacting the locking surface of the locking groove (14).

3. A system as claimed in claim 1 or 2, wherein ~~characterized in that~~ the locking surface (16) of the locking element (8) is extended from a front side (22) of the strip (6) through a height in said first direction that is less than or equal to 2 mm.

4. A system as claimed in any one of the preceding claim 1, wherein ~~claims, characterized in that~~ the first mechanical connection is provided by the joint edge (4) of the groove panel (2) engaging, in said first direction (D1), between the joint edge (3) of the strip panel (1) and the front side of the strip (6).

5. A system as claimed in any one of the preceding claim 1, wherein ~~claims, characterized in that~~ the strip (6) integrated with the strip panel (1) is made of a material different from that of the strip panel (1) and fixedly mounted on the strip panel (1) at the factory.

6. A system as claimed in claim 5, wherein ~~characterized in that~~ the strip (6) at least for one of the two panels (1, 2) is received in a countersunk

groove ~~(40; 42)~~ in the rear side ~~(16; 16')~~ of this one panel ~~(11; 27)~~.

7. A system as claimed in claim 5 ~~or 6~~, wherein ~~characterized in~~ that the strip ~~(6)~~ is mounted in an equalising groove ~~(40)~~ which is countersunk in the rear side ~~(10')~~ of the strip panel ~~(11)~~ and exhibits an exact, predetermined distance ~~(E)~~ from its bottom to the front side ~~(21')~~ of the strip panel ~~(11)~~.

~~that~~ the part of the strip ~~(6)~~ projecting behind the groove panel ~~(27)~~ engages a corresponding equalising groove ~~(42)~~ which is countersunk in the rear side ~~(16)~~ of the groove panel ~~(27)~~ and which exhibits the same exact, predetermined distance ~~(E)~~ from its bottom to the front side ~~(20')~~ of the groove panel ~~(27)~~, and

~~that~~ the strip ~~(6)~~ has at least such a thickness that the rear side ~~(44)~~ of the strip is flush with the rear sides ~~(10, 16')~~ of the panels.

8. A system as claimed in claim 7, wherein ~~characterized in that~~ the strip ~~(6)~~ has such a thickness that it is only partly received in the equalising grooves ~~(40, 42)~~.

9. A system as claimed in ~~any one of claims 5-8~~, claims 5 wherein ~~characterized in that~~ the ~~strip~~ ~~(6)~~ is fixed to the strip panel ~~(11)~~ by means of a mechanical connection.

10. A system as claimed in claim ~~6~~ 9, wherein ~~characterized in that~~ the mechanical connection between the strip ~~(6)~~ and the ~~strip~~ panel ~~(11)~~ comprises a gripping edge ~~(33)~~ defined by two recesses ~~(24, 50)~~ in the rear side ~~(10')~~ of the ~~strip~~ panel, and tongues, lips or the like ~~(34, 35)~~ which are bent or punched from the strip ~~(6)~~ and which press against opposite outer sides of the gripping edge ~~33~~.

11. A system as claimed in claim ~~6~~ 9, wherein ~~characterized in that~~ the mechanical connection between the strip ~~(6)~~ and the ~~strip~~ panel ~~(11)~~ comprises a recess

~~(58)~~ in the rear side ~~(12)~~ of the ~~strip~~ panel, and tongues, lips or the like ~~(60)~~ which are bent or punched from the strip ~~(6)~~ and which press against opposing inner sides of the recess ~~(58)~~.

12. A system as claimed in ~~any one of claims 5-11~~ claim 5, ~~characterised in that~~ wherein the strip ~~(6)~~ is fixed to the ~~core~~ panel ~~(2)~~ by means of a binder.

13. A system as claimed in ~~any one of claims 5-12~~ claim 5, ~~characterised in that~~ wherein the strip ~~(6)~~ is made of a flexible, preferably resilient material, such as sheet aluminium.

14. A system as claimed in ~~any one of the preceding claims~~ claim 1, ~~characterised in that~~ wherein the locking element ~~(6)~~ consists of a locking edge extended continuously along the strip ~~(6)~~.

15. A system as claimed in ~~any one of claims 1-13~~ claim 1, ~~characterised in that~~ wherein the locking element ~~(6)~~ consists of a plurality of spaced-apart locking elements distributed throughout the length of the strip ~~(6)~~.

16. A system as claimed in ~~any one of the preceding claims~~ claim 1, ~~characterised in that~~ wherein the panels ~~(2)~~ ~~3~~ are rectangular and intended, at each of their four edges ~~(3, 4, 5, 6)~~, to be joined to a similar panel by a first mechanical connection of the aforementioned type and a second mechanical connection of the aforementioned type, each panel having a first pair of opposite joint edges ~~(3, 4)~~, one of which is provided with a strip ~~(6)~~ of the aforementioned type and the other of which is provided with a locking groove ~~(7)~~ of the aforementioned type, and a second pair of opposite joint edges ~~(5, 6)~~, one of which is provided with a strip ~~(6)~~ of the aforementioned type and the other of which is provided with a locking groove ~~(7)~~ of the aforementioned type.

17. A system as claimed in ~~any one of the preceding claims~~ claim 1, ~~characterised in that~~ wherein an underlay ~~(8)~~ of floor boards, foam, felt or the like is fixed to the rear sides ~~(9, 10)~~ of the panels.

18. A system as claimed in claim 17, ~~characterized in that~~ wherein the underlay ~~(46)~~ is fixed so as to cover the strip ~~(6)~~ in said second direction at least up to the locking element ~~(8)~~, such that a joint between the underlays ~~(46)~~ of the two adjacent panels is offset in said second direction relative to the ~~joint~~ first and second edges ~~(3, 4)~~.

19. A system as claimed in any one of the preceding claims, ~~characterized in that~~ wherein a sealing means, such as a sealing compound, a rubber strip or the like, is provided on the front side ~~(22)~~ of the strip between the locking element ~~(8)~~ and the ~~joint~~ first edge ~~(3)~~ of the strip panel to seal against the ~~groove~~ adjacent panel ~~(21)~~.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER NUMBER
	7

[illegible] - DUFFETT JR
[illegible] DIANE SWECKER [illegible]
[illegible] 1404
[illegible] VA 22313-[illegible]

DATE MAILED: [illegible]

This is a communication from the examiner in charge of your application
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474
6. ☐ _____

Part II SUMMARY OF ACTION

1. ☒ Claims 1-20 are pending in the application.
   Of the above, claims 12 is are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-11 & 13-20 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☒ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

PTOL-326 (Rev. 2/93)

Claim Rejections - 35 USC §102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.

8. Claims 1,4,6, and 14-18 are rejected under 35 U.S.C. §102(b) as being anticipated by TROTTER, Jr. TROTTER, Jr. teaches the use of a resilient floor system consisting of floor panels (21,23,25) joined by tongue (47) and groove (49) connection and interconnected by spring clip (33). The clip (33) of TROTTER, Jr. engages grooves (37,43) located on the underside of floor panels (21,23,25). Clip (33) of TROTTER, Jr. further comprises cleats (39) spaced longitudinally along the locking leg (35). TROTTER, Jr. further teaches the use of an underlay (11) on which the resilient flooring system is to be placed.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1,988,201

5,029,425

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvonne Horton-Richardson whose telephone number is (703) 308-2168.

YHP YHP
June 10, 1996

Carl

Carl D. Friedman
Supervisory Patent Examiner
Group 3500

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

[October 15, 1996]

In re Patent: Application of)	Box: Non-Fee Amendment
Tony PERVAN)	Group Art Unit: 3504
Application No.: 0S/436,224)	Examiner: Horton-Richardson
Filed: May 17, 1995)	
For: SYSTEM FOR JOINING BUILDING BOARDS)	

AMENDMENT

Application Serial No. 08/436.224
Attorney's Docket No. 003300-339

REMARKS

[p.9]

Prior Art Rejection:

Claims 1, 4, 6, and 14-18 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,819,932, issued to Trotter, Jr. (hereinafter "Trotter").

There are several important distinctions between the floor system disclosed by Trotter and the system of the present invention. In particular, Trotter is intended to provide a springlike floor surface. In addition, it is not an intention that Trotter be removable. In contrast to Trotter, it is not an intention of the present invention to provide a springlike floor surface. In further contrast to Trotter, it is an important object of the present invention to provide a removable flooring system. With these distinctions in mind, several distinctions between the claims of the present application and Trotter will now be discussed.

First, the system of claim 1 defines a strip that is integrated with one of the panels. Trotter does not teach or suggest such a strip that is integrated with a panel.

Furthermore, claim 1 further defines the strip as "extending throughout substantially an entire length of the joint edge of the strip panel". Not only does Trotter not teach or suggest a strip integrated with another panel, it clearly does not teach or suggest such a strip as extending throughout substantially an entire length of the joint edge.

Trotter also does not teach or suggest a system wherein two panels, when joined together, occupy a relative position where a play exists between a locking groove and a locking surface on locking element that is facing the joint edges.

Specifically, Trotter uses spring clips to hold the boards together so as to prevent play from occurring between the two boards. The claimed "play" of the present invention is important for two reasons. One, it enables the panels to slide movably with respect to each other along the direction of the joint edge, which is specifically claimed in the penultimate paragraph of claim 1. This movability allows the short ends of the panels to be placed adjacent each other when installing the floor. Second, the play further enables disassembly of the floor when required.

In contrast to the claimed "play" of the present invention, Trotter specifically states that an intention of his invention is to use the spring clips to hold the boards close together in order to prevent pinching. Thus, Trotter specifically prevents the claimed play. Furthermore, the spring clips of Trotter also further prevent the claimed mutual displacement of the panels in the direction of the joint edges.

To further distinguish Trotter from the claimed "mutual displacement" feature of the present invention, the Examiner's attention is directed to column 4, lines 10-15, wherein the cleats 39 are described. As set forth in the specification of Trotter, the cleats 39 are intended to lock the spring clips 33 into the groove of the board in which the clip is attached. Thus, the cleats 39 clearly prevent any mutual displacement. Even without the cleats 39, the springlike force of the clips 33 and the edges thereof would clearly prevent any mutual displacement of the panels in a direction of the joint edges.

Trotter also does not teach or suggest the feature of the present invention that is defined in the last claim of claim 1, i.e., that the second mechanical connection enables the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip. This claimed function is simply not possible in the floor system disclosed by Trotter. Trotter's system cannot be easily taken up after it is installed. Subsequent to the assembly of the

Trotter floor system, the cleats 39 will effectively engage the sides of the locking grooves, whereby any attempt to turn a floor panel upwards will fail.

Accordingly, it should now be clear that the system of Trotter is completely different from that of the present invention. The Trotter patent does not teach or suggest several of the important features that are defined in claim 1. Accordingly, the Examiner is respectfully urged to reconsider and withdraw the rejection of claim 1 based on Trotter.

In view of the differences in the objects and performance of the claimed floor system and the Trotter floor system, it should also be clear that the claimed invention defined in claim 1 is also not obvious in view of Trotter. Accordingly, the Examiner is respectfully requested to withdraw the rejection of claim 1 based on Trotter.

Claims 2-20 depend from claim 1, and are thus also patentable over Trotter at least for the reasons set forth above with respect to claim 1.

Although several amendments have been made to the claims of the present application, it should be noted that such amendments have been made simply to remove reference numerals and provide antecedent basis where necessary for certain of the claim elements. The amendments to the claims are not intended and do not alter the scope of the claim, and thus may not be used as the basis for making a subsequent rejection final.

In view of the fact that claim 1 is now in condition for allowance, the Examiner is respectfully requested to consider claim 12.

In the event that there are any questions concerning this Amendment, or the application in general, the Examiner is respectfully urged to telephone the undersigned attorney so that prosecution of the application may be expedited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By:

William C. Rowland
Registration No. 30,888

Post Office Box 1404
Alexandria, Virginia 223!3-1404
(703) 836-6620

Date: October 15, 1996

See
Fold Out Exhibit

PCT Application
Office Action Summary

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO

EXAMINER	
ART UNIT	PAPER NUMBER
	11

DATE MAILED:

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

Responsive to communication(s) filed on 10/15/96

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire _____ month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- [X] Claim(s) 1-20 is/are pending in the application.
  - Of the above, claim(s) 12 is/are withdrawn from consideration.
- [ ] Claim(s) _____ is/are allowed.
- [ ] Claim(s) _____ is/are rejected.
- [X] Claim(s) 1-11 & 13-20 is/are objected to.
- [ ] Claims _____ are subject to restriction or election requirement.

Application Papers

- [ ] See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The proposed drawing correction, filed on _____ is [ ] approved [ ] disapproved.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- [ ] All [ ] Some* [ ] None of the CERTIFIED copies of the priority documents have been
  - [ ] received.
  - [ ] received in Application No. (Series Code/Serial Number) _____.
  - [ ] received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- *Certified copies not received: _____.
- Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- [X] Notice of Reference Cited, PTO-892
- [ ] Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- [ ] Interview Summary, PTO-413
- [ ] Notice of Draftsperson's Patent Drawing Review, PTO-948
- [ ] Notice of Informal Patent Application, PTO-152

-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --

BEST AVAILABLE COPY

Allowable Subject Matter

4. The examiner is withholding the previous indication of allowance until the 35 USC § 112 problems indicated above are cleared.

5. Claims 1-20 would be allowable if rewrinen or amended to overcome the rejection(s) under 35 U.S.C. 112 set forth in this Office action.

6. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach the use of adjacent joint floor paneling wherein the floor panels are interconnected by locking element located within a groove formed on the underside in such a way so as to allow for displacement of the panels in a direction toward the joints and to allow for the locking member to be released from the groove when the panel is rotated about the joint.

7. Any inquiry, concerning this communication or earlier communications from the examiner should be directed to Yvonne Horton-Richardson whose telephone number is (703) 308-2168.

December 24, 1996

Attorney's Docket No. 003300-339

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

[June 6, 1997]

In re Patent Application of	)
	) Group Art Unit: 3504
Tony PERVAN	)
	) Examiner: Horton-
Application No.: 08/436,224	) Richardson
	)
Filed: May 17, 1995	)
	)
For: SYSTEM FOR JOINING BUILDING BOARDS	)

AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Official Action dated January 6, 1997, please amend the above-identified patent application as follows:

IN THE CLAIMS:

[p.7]

22. A system for providing a joint between adjacent building panels, comprising:

each of said building panels including a first edge and a second edge such that the first edge of each of said building panels forms a first mechanical connection wiuh the second edge of an adjacent one of the building panels locking the first and second edges of the building panels to each other in a first direction at right angles to a principal plans of the panels, and

a locking device arranged on a rear side of the building panels forming a second mechanical connection locking the building panels to each other in a second direction parallel to the principal plane and at right angles to the first and second edges, said locking device fitting within a locking groove extending parallel to and spaced apart from the first edge of said building panels, and which locking groove is open at the rear side of the building panels,

the locking device comprising a strip integrated with the second edge of each of said building panels, said strip extending throughout substantially an entire length of the second edge and being provided with a locking element projecting from the strip, such that when two adjacent building panels are joined together, the strip projects from the rear side of the second edge of the panels with its locking element received in the locking groove of an adjacent building panel,

the first and the second mechanical connections both allow mutual displacement of the building panels in a direction of the first and second edges, and

the second mechanical connection enables the locking element to leave the locking groove if the respective building panel is turned its first edge angularly away from the strip.

REMARKS

[p.11]

Reconsideration of the above-identified patent application is respectfully requested. The Examiner is thanked for the telephone interview with applicant's attorney on December 16, 1996, and her helpful suggestions for amending the claims.

However, upon careful review of the application, it was determined that more significant amendments to the claims would be appropriate than those suggested by the Examiner. In particular, the claims have been amended to clarify that each of the building panels have first and second edges, wherein the locking groove is adjacent uo the first edge and the strip extends from the second edge. The foregoing amendments do not preclude the concept that in unusual situations one edge of the building panel may be irregular in order to fit against a wall or other structure.

It is believed that the foregoing amendments to the claims respond in detail to each of the issues raised by the Examiner, and thus should overcome the rejection rendered under 35 U.S.C. §112, second paragraph. In the event that the Examiner feels that additional amendments are necessary, the Examiner is respectfully urged to telephone the undersigned attorney so that such amendments may be discussed and implemented as quickly as possible.

To further define the protection to which applicant is entitled, new claims 21-23 are submitted herewith. New independent claim 21 is substantially similar to claim 1 except that it defines the strip as being integrally formed with the second edge of each of the building panels. Accordingly, claim 21 is also in condition for allowance.

New independent claim 22 is substantially the same as independent claim 1 except that it does not define the play that

exists between the locking groove and the locking surface. As such, displacement of the panels is still facilitated in a direction along the joints which is what is believed to be meant by the Examiner's Statement of Reasons for the indication of allowable subject matter. Accordingly, claim 22 is also patentable over the cited prior art.

New independent claim 23 is similar to dependent claim 7 rewritten in independent form, except that it has omitted a couple of details of the original claim 1. Nevertheless, it is clear that the subject matter of new independent claim 23 is clearly patentable over the cited prior for the same reasons that apply to claim 1. Accordingly, new independent claim 23 is also in condition for allowance.

Accordingly, the present application should now be in condition for allowance.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

William C. Rowland
Registration No. 30,888

Post Office Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620
Date: June 6, 1997

APPENDIX J

UNITED STATES PATENT

Patent No. 4,819,932

See Foldout Exhibits
Diagrams

United States Patent [19]

Trotter, Jr.

[11] **Patent Number: 4,819,932**

[45] **Date of Patent: Apr. 11, 1989**

[54] **AEROBIC EXERCISE FLOOR SYSTEM**

[76] Inventor: **Phil Trotter, Jr.**, 9292 East 131st St., Noblesville, Ind. 46060

[21] Appl. No.: **834,819**

[22] Filed: **Feb. 28, 1986**

[51] **Int. Cl.**[4] **A63J 3/00**

[52] **U.S. Cl.** **272/3**; 52/480; 52/309.8

[58] **Field of Search** 272/3, 109; 52/480, 52/390, 393, 309.8, 384, 385, 386, 387, 388, 389

[56] **References Cited**

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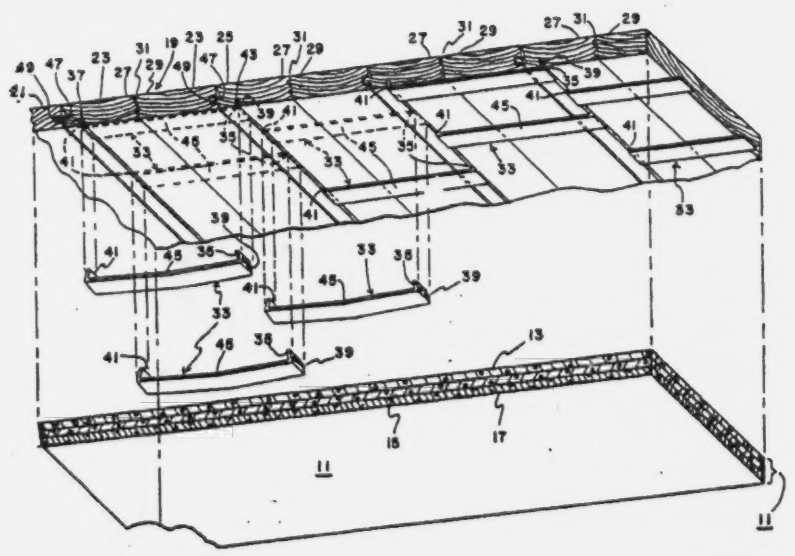
Primary Examiner—Robert A. Hafer
Assistant Examiner—Sam Rimell
Attorney, Agent, or Firm—Richard C. Litman

[57] **ABSTRACT**

A resilient wood floor for aerobic exercise. The boards of the floor are free to pivot in tongue and groove joints. The wood is laid on a foam pad which will always yield during ordinary human exercises. The boards are held together by spring clips which lengthen when a load is applied to the boards, while holding the boards close together in a manner to prevent pinching.

7 Claims, 2 Drawing Sheets



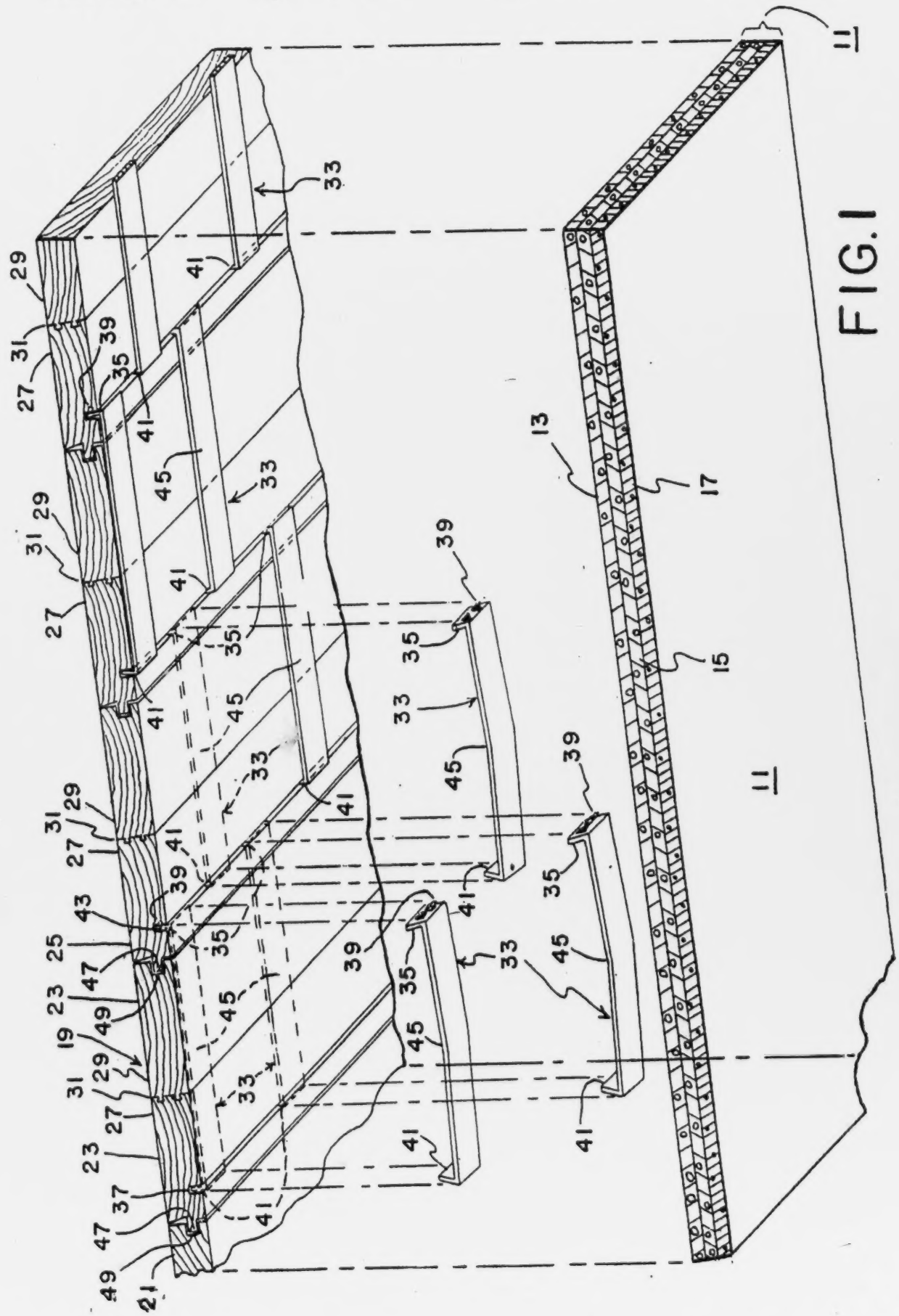


FIG. 1

FIG. 2A

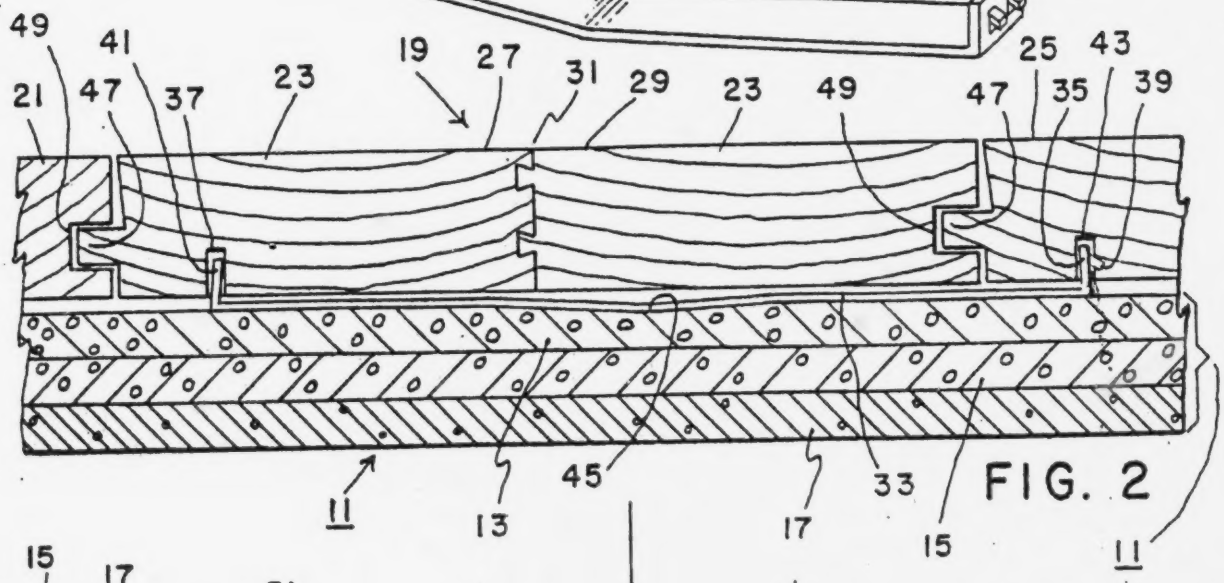


FIG. 2

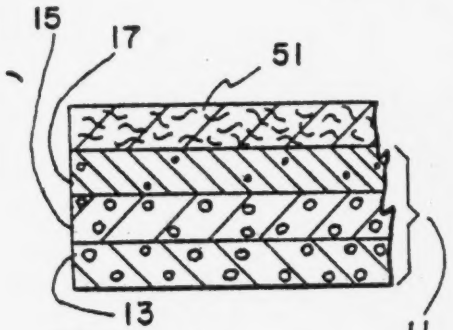


FIG. 4

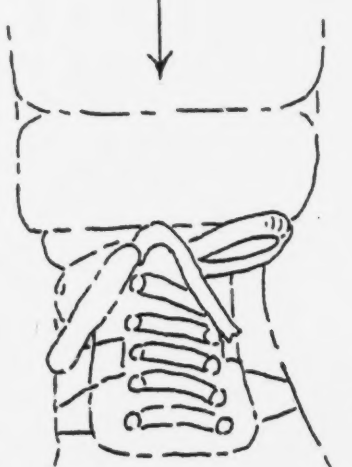
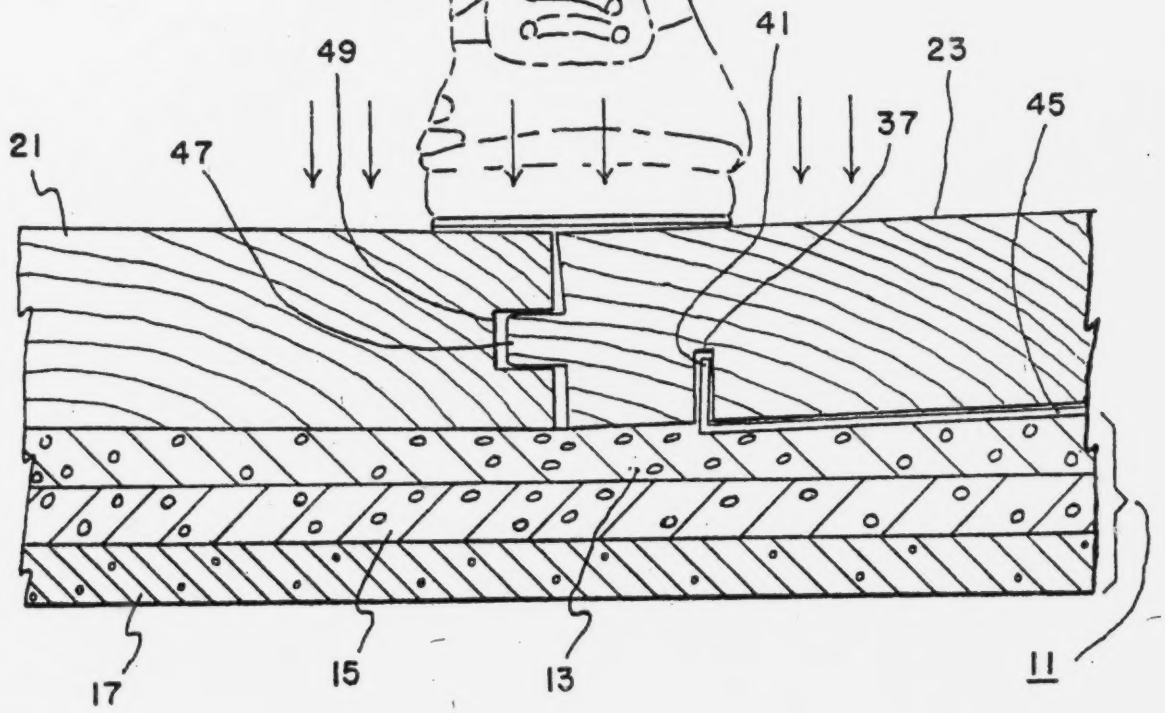


FIG. 3



4,819,932

[1]

AEROBIC EXERCISE FLOOR SYSTEM

BACKGROUND OF THE INVENTION

This invention relates to aerobic exercise floor systems[5] having the type of resiliency satisfying participants, to pads suitable for creating such floor systems, and to spring clips for holding the wear layer in place and in allowing the wear layer to flex.

A major concern of aerobic professionals is the disproportionate [10] number of instructors and participants who become injured during aerobic exercies. Shin splints, tendonitis, stressed and sore joints, muscle trauma and ankle roll over are examples of the type of injuries which occur. Ultimately it is the floor that must [15] accept responsibility for reducing shock, promoting comfort and protecting against these injuries.

Various flooring systems have been developed to provide a cushioning effect. U.S. Pat. No. 3,684,630 discloses a steel floor having grooves cut into the steel [20] over a foam underlayer. A wear layer is placed over the steel. "The deeper the wear layer is depressed the greater is the tendency to rupture the wear layer and to crush the underlying material", according to the patent describing the mechanics of a wear material with limited [25] load distributing factors. For an exercise floor, the continuous flexing of the steel where the grooves have been cut could cause flex cracking of the joints. U.S. Pat. No. 3,388,516 discloses the use of corrugated steel as a cushioning material as an improvement over concrete. [30] U.S. Pat. No: 3,902,293 discloses bonded floor tile over a network of filaments containing spheroidal cells of gas as an improvement over bonding the floor tile directly to the sub

floor. The tile are locked together by tongue and groove on all four sides, or by adhesive. [35] U.S. Pat. No. 4,169,688 discloses an artificial ice skating ring floor on a layer of cushion material. The floor plates are held together by U shaped insertion members.

SUMMARY OF THE INVENTION

[40] The floor system of the present invention aids leg motion in both the lateral and vertical directions. In vertical motion the leg carries considerable energy against the surface. The floor system of the present invention absorbs the energy and deflects under the [45] impact to disperse the energy away from the legs and feet to reduce the shock of the impact. The floor system of the present invention is also firm enough to provide some rebound. Also, a firm surface stabilizes the feet and lessens the chance of ankle injury caused by foot [50] rollover.

The surface of the floor system of the present invention provides the proper traction for lateral and rotational motion to accomplish the necessary sliding, twisting and turning found in today's tough aerobic routines. [55] The preferred surface is a wood surface having a floating air cushioned suspension system to provide energy return qualities. In addition, the necessary traction for horizontal and rotational movement can be provided by appyling various types of finishes. And finally, wood is [60] much more hygienic and easier to maintain than carpet which harbors bacteria and odors that require cleaning with a hot-water extractor and sanitizer at least weekly.

The cushioned floor of the present invention is made up of a number of elements. A lower layer of a foamed [65] pad has a sufficient thickness and compressive strength that it will not bottom out i.e., it will always yield to static and impulsive loading when used by humans

doing exercise on the floor. An attrition resistant upper layer of boards joined at a pivoting tongue and groove joints provides an exercising surface. The lengthwise direction of the boards runs in the same direction as the [5] joints. A slot is provided in each board parallel to the joints. A U shaped spring clip having upright legs is inserted into the slots. One leg of the spring clip contains one or more cleats which protrude away from the direction of insertion of the legs and toward a wall of [10] one slot. The combined width of the cleat and the leg inserted in the slot are wider before insertion into the slot than the slot whereby the leg containing the cleats is locked into the slot into which it is inserted thus holding the spring clip in place. The boards arc held together [15] by tension in the spring clip, the spring clip being curved in the lengthwise direction between the legs when there is no load on the boards; so that when a load is applied and the boards flex, the curved portion straightens so as not to unduly restrain the joint from [20] flexing. While a minimum number of boards required to practice the present invention is two, in actual practice a plurality of boards is used to cover the entire exercise area, each board joined to each adjacent board by spring clips

[25] The foamed pad is inventive in its own right. The foamed pad has a thickness of about one half inch to about an inch and one half and a reaction to compressive loading of about 12 to 16 pounds per square inch at [30] 50% deflection. The pad preferable has at least two layers and more preferably three layers, one surface layer of which has a density of approximately one half the density of the opposed surface layer. The less dense side is the upper layer of the pad when placed under the [35] boards. The pad is preferably made of flexible closed, cell polyethylene foam which is crosslinked by electron irradiation.

The cleats of the spring clip are preferably formed from the material of the leg to which the cleats are [40] attached. The cleats form an angle of less than 90 degrees with the surface of the leg from which they were cut. The cleats preferably extend at an angle of from 25 degrees to 60 degrees from the surface of the leg to which the cleats are attached.

[45] Preferably the attrition resistant layer of boards of the floor are made of wood which has been press-dried with pressure on faces of the boards to reduce shrinkage in the face width.

The pad can also be used under a carpet as an exercise [50] floor though this is not preferred. When the multilayer pad is used under carpet the denser side is used as the top side of the pad.

BRIEF DESCRIPTION OF THE DRAWINGS

[55] FIG. **1** is an exploded view of the preferred exercise floor.

FIG. **2** is an end view of a section of the exercise floor.

FIG. **2A** is a view of the spring clip.

[60] FIG. **3** shows the deflection of the exercise floor during use.

FIG. **4** is a view of an exercise floor using a carpet.

DETAILED DESCRIPTION

[65] Referring now to the drawings. A bottom layer **11** is a pad made of flexible closed-cell polyethylene foam which is cross linked by means of an electron irradiation process. It is made as a continuous, smooth sheet with

[3]

small cells. The foam is in the form of a three layer pad **11**. The layers are one-fourth of an inch thick and thermally laminated to each other. The top layer **13** and center layer **15** each have a two pounds per square foot density, and the bottom layer **17** has a four pound per [5] square foot density. The pad **11** is resistant to high temperatures, has a very low water absorption capability, does not transmit moisture, has excellent thermal insulation characteristics and is resistant to most chemicals. The technical properties of the pad **11** are as follows.[10]

1. Compression Strength--12.7 to 15.5 pounds per square inch at 50 percent deflection.
2. Compressive Set--16 percent maximum of original thickness after 22 hours of loading and 24 hours of recovery.[15]
3. Tensile Strength----45 to 55 pounds per square inch.
4. Elongation--124 percent to 152 percent to break in the machine direction.
5. Tear Resistance--10 to 12 pounds per square inch in the machine direction.[20]
6. Shore Hardness--typical value of 7 on the AA scale.
7. Thermal Stability--1.5 percent maximum shrinkage over a three hour period with no load at 180 degrees Fahrenheit. [25]
8. Load Temperature Brittle Point--minus 110 degrees Fahrenheit.
9. Thermal Conductivity--0.25 BTU per hour, foot squared, degrees Fahrenheit per inch K factor at 7 degrees Fahrenheit.[30]
10. Water Absorption--0.04 pounds per square foot of cut surface.

Above the pad **11** is flooring **19**, which is a series of boards including boards **21**, **23** and **25**. The boards **21**, **23** and

25 are machined tongue and grooved, end-matched and assembled from contiguous and adjacent beech strips **27** and **29**. The strips **27** and **29** are assembled at the longitudinal joint **31** by means of a jointer using a double dovetail and permanently glued using a polyvinyl acetate adhesive centrally located in the [40] boards **21**, **23** and **25**. A standard grade of beech is used and each board **21**, **23**, and **25** is five and one sixth inches wide by twelve foot one and five eights inches long by seven eights of an inch thick. The boards **21**, **23** and **25** weigh 3.28 pounds per square foot. [45]

The beech flooring boards **21**, **23** and **25** are pressed-dried to stabilize the expansion thrust of the floor. The press drying process is a drying method by which heated plates having a temperature of 345 degrees Fahrenheit are pressed against the top and bottom face of [50] each flooring strip **27** and **29** at a pressure of 170 pounds per square inch. Through this drying process, shrinkage occurs only in the thickness and not in the face width, as pressed dried boards expand in the thickness first.

During the press drying process, the strength of the [55] beech is increased by 15 percent. The green beech is at a thickness of one and one fourth inches prior to drying. After the drying process the beech has been compressed to a nominal one inch in thickness. The specific gravity of the beech is increased by approximately 10 percent. [60] Therefore the press drying not only stabilizes the beech flooring **19**, but also increases the load bearing capability of the flooring **19**.

Each board **21**, **23** and **25** is sanded to a perfectly smooth seven eights inch thickness, and finished with 3 coats of two component polyurethane. The finish is automatically applied to the boards **21**, **23** and **25** in three treatments in a seal curtain coating plant which

[4]

gives the greatest possible uniformity in the thickness of the finish. Prior to applying the finish, the boards **21**, **23** and **25** are preheated with infrared rays so that the penetration of the lacquer into the grain of the wood is [5] considerably increased. This gives the highest durability and adhesion for the next coat of finish. To obtain the best results, the boards **21**, **23** and **25** are mechanically sanded before the second and third coat of finish is applied.

[10] The boards **23** and **25** are held together by spring clip **33**. Leg **35** of monolithic spring clip **33** is fast inserted into groove **37** of board **23**, and is locked in place by cleat **39**. Board **23** with spring clip **33** attached is then laid on pad **11**. Board **25** is then laid with leg **41** inserted [15] into groove **43**.

Foot pressure as shown in FIG. **3** pushes boards **23** and **25** down into pad **11**, and causes the curve **45** in spring clip **33** to straighten. Also tongue **47** and groove **49** rotate slightly with respect to each other. There is [20] sufficient freedom on play between tongue **47** and groove **49** so as not to restrain boards **23** and **25** from reacting to the pressure or to cause breakage of tongue **47**.

The flooring system can be installed over any level [25] subfloor in a day or two and can be disassembled and reassembled easily.

Referring now to FIG. **4**, a carpet **51** is laid over pad **11**. A carpet with a synthetic backing withstands constant cleaning and bacterial growth. One tenth gauge [30] and 24 to 26 ounce carpeting is advised for longest wear. Cut pile reduces friction and hides seams. Seams are heat sealed. A bacteriostat incorporated into the material of the carpet **51** inhibits bacterial growth.

Various modifications of the invention are possible [35] without departing from the scope of the appended claims.

I claim:

1. A cushioned floor comprising in combination:
a lower layer of a foamed pad having sufficient thickness [40] and compressive strength that it will always yield when used with static and impulsive loading caused by humans doing exercise on the floor; and
an attrition resistant upper layer of at least two distinct boards each board comprised of a pair of [45] adjacent contiguous strips, said strips joined to each other by a longitudinal dove tail joint centrally located in said board, said at least two distinct boards having at least one tongue and groove pivoting joint joined with play, said at least one [50] tongue and groove pivoting joint having one lengthwise direction, a slot running parallel to said lengthwise direction of said pivoting joint in alternate strips of said at least two distinct boards, a U-shaped resilient monolithic clip having upright [55] legs inserted into the slots overlapping and asymmetrical to said centrally located longitudinal dove tail joint, one leg of which contains at least one cleat which protrudes away from the directions of the legs and toward a wall of one slot, the combined [60] width of the cleats and the leg inserted in the one slot being wider thus the one slot before insertion into the slot whereby the leg containing said at least one cleat is locked into the slot into which it is inserted thus holding the spring clip in place, the [65] boards being held together by tension in the spring clip, the spring clip being curved in the lengthwise direction between the legs when there is no load on the boards;

[5]

so that when a load is applied and the boards flex, the curved portion straightens so as not to unduly restrain the joint from flexing.

2. A floor of claim 1 having a plurality of more than two boards, each board joined to each adjacent board [5] by one or more of the spring clips.

3. A floor of claim 1 wherein the foamed pad has a thickness of from one half to two inches.

4. A floor of claim 1 wherein the foamed pad has a [10] thickness of about three quarters of an inch and a compressive strength of about 12 to 16 pounds per square inch at 50% deflection.

[6]

5. A floor of claim 4 wherein the foamed pad comprises an upper layer and a lower layer, the upper layer of which has a density of approximately one half the density of the lower layer.

[5] 6. A floor of claim 1 wherein the foamed pad comprises flexible closed-cell polyethylene foam.

7. The floor of claim 1 wherein the one or more cleats are formed from the material of the leg to which the one or more cleats are attached, and the one or more cleats [10] form an angle of less than 90 degrees with a plane formed by an opening created by the formation of the one or more cleats.

* * * * *

APPENDIX K

Patents

and the

Federal Circuit

Sixth Edition

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its limitations, which give meaning to the various elements of the claim.[71] A court commits fundamental legal error when it analyzes each claim by a single word description of one part of the claimed invention. In patent law, a word means nothing outside the claim and the description in the specification. A disregard of claim limitations would render claim examination

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[71] *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994); *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985).

in the PTO meaningless. If a court may so rewrite claims, the entire statutory-regulatory structure that governs the draining, submission, examination, allowance, and enforceability of claims would crumble.[72] There is no legally recognizable or protected gist or heart of the invention.[73] Reliance upon a finding that a "novel element" of a structural invention lies in the operation of a specification-described embodiment of the claimed structure would render meaningless the statutory requirement for claiming, the statutory requirement for treating claims individually, and the entire examination system centering on the allowance or rejection of claims.[74]

It cannot be said that a part of a claim is "claimed" subject matter. Claims, being definitions that must be read as a whole, do not "claim" or cover or protect all that their words may disclose. Even though a claim to an A-B-C combination of steps may contain a detailed description of step A, that does not give the patentee any patent right in step A alone and it is legally incorrect to say that step A is "patented."[75]

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[72] *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1 USPQ2d 1593 (Fed. Cir. 1987).

[73] *Everpure, Inc. v. Cuno, Inc.*, 875 F.2d 300, 10 USPQ2d 1855, 1857 (Fed. Cir. 1989); *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 309 (Fed. Cir. 1983). There is no such thing as a patented portion of a patented combination. *Porter v. Farmers Supply Serv., Inc.*, 790 F.2d 882, 229 USPQ 814, 816 n.4 (Fed. Cir. 1986).

[74] *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 227 USPQ 577 (Fed. Cir. 1985).

[75] *General Foods Corp. v. Studiengesellschaft Kohle mbH*, 972 F.2d 1272, 23 USPQ2d 1839 (Fed.Cir. 1992). Claims must be read as a whole in analyzing a defense of double patenting. *Id.*

(c) Specification

A technical term used in a patent document is interpreted as having the meaning that it would be given by persons experienced in the field of the invention, unless it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning. Thus, it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning.[76] The specification that is relevant to claim construction is the specification of the patent in which the claims reside.[77]

[289]

The specification informs, but does not control, claim construction. Rather, the claim language itself governs the meaning of the claim.[78] Thus claims are always construed in

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[76] *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 42 USPQ2d 1577 (Fed. Cir. 1997).

[77] *Young Dental Mfg. Co. v. Q3 Special Prods., Inc.*, 112 F.3d 1137, 42 USPQ2d 1589 (Fed. Cir. 1997). See also, e.g., *Rowe v. Dror*, 112 F.3d 473, 42 USPQ2d 1580 (Fed. Cir. 1997). In determining whether a patented invention is anticipated, the claims are read in the context of the patent specification in which they arise and in which the invention is described. *Glaverbel S.A. v. Northlake Mkt'g & Supp., Inc.*, 45 F.3d 1550, 33 USPQ2d 1496 (Fed. Cir. 1995).

[78] *Envirco Corp. v. Clestra Cleanroom Inc.*, 209 F.3d 1360, 54 USPQ2d 1449 (Fed. Cir. 2000).

light of the specification,[79] but that does not mean that the claims incorporate all disclosures of the specification.[80] Conversely, a patent claim should be construed to encompass at least one disclosed embodiment in the written description portion of the patent specification. This maxim flows from the statutory requirement that the specification shall contain a written description of the invention, which requires a patent applicant to disclose in the specification sufficient subject matter to support the breadth of the claims. A claim construction that does not encompass a disclosed embodiment is thus rarely, if ever, correct and would require highly persuasive evidentiary support.[81]

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[79] E.g., *D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570, 225 USPQ 236 (Fed. Cir. 1985).

[80] *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 7 USPQ2d 1057 (Fed. Cir. 1988); *Sjolund v. Musland*, 847 F.2d 1573, 6 USPQ2d 2020 (Fed. Cir. 1988); *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 228 USPQ 90 (Fed. Cir. 1985); *Lemelson v. United States*, 752 F.2d 1538, 224 USPQ 526 (Fed. Cir. 1985); *J.P. Stevens & Co. v. Lex Tex Ltd.*, 747 F.2d 1553, 223 USPQ 1089 (Fed. Cir. 1984); *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 220 USPQ 592 (Fed. Cir. 1983). A court should not ordinarily rely on the preferred embodiments alone as representing the entire scope of the claimed invention. *CCS Fitness Inc. v. Brunswick Corp.*, 288 F.3d 1359, 62 USPQ2d 1658 (Fed. Cir. 2002).

[81] *Johns Hopkins Univ. v. Cellpro Inc.*, 152 F.3d 1342, 47 USPQ2d 1705 (Fed. Cir. 1998); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 39 USPQ2d 1573, 1578 (Fed. Cir. 1996). A claim interpretation that excludes the preferred embodiment is rarely, if ever, correct. *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 45 USPQ2d 1498 (Fed. Cir. 1998). It is unlikely that an inventor would define the invention in a way that excludes the preferred embodiment or that those skilled in the art would read it

There is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification.[82] While examples disclosed in the preferred embodiment may aid in the proper interpretation of a claim term, the scope of a claim is not necessarily limited by such examples.[83] Thus, what is

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that way. *Hoechst Celanese Corp. v. BP Chem. Ltd.*, 78 F.3d 1575, 38 USPQ2d 1126 (Fed. Cir. 1996). A claim construction that would exclude the preferred embodiment described in the specification cannot be sustained. *Burke Inc. v. Bruno Indep. LivingAids Inc.*, 183 F.3d 1334, 51 USPQ2d 1295 (Fed. Cir. 1999). Despite these observations, the court in *Elekta Instr. S.A.v.O.U.R. Sci. Int'l Inc.*, 214 F.3d 1302, 54 USPQ2d 1910, 1914 (Fed. Cir. 2000), concluded that it was dealing with the rare case in which the only correct interpretation was one that excluded the only disclosed embodiment.

[82] *Comark Comm. Inc. v. Harris Corp.*, 156 F.3d 1182, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998). But mere observation by the district court that the written description discloses only a particular structure does not constitute reading that structure into the claims as a limitation. It is entirely proper to use the specification as a starting point for construing disputed language. *Laitram Corp. v. Morehouse Indus. Inc.*, 143 F.3d 1456, 46 USPQ2d 1609 (Fed. Cir. 1998).

[83] *Ekchian v. Home Depot, Inc.*, 104 F.3d 1299, 41 USPQ2d 1364 (Fed. Cir. 1997). Claims, not the specification embodiments, define the scope of the protection. *American Perrnahedge, Inc. v. Barcana, Inc.*, 105 F.3d 1441, 41 USPQ2d 1614 (Fed. Cir. 1997). It is not true that where only one embodiment is disclosed in the specification, claim terms are limited to the embodiment disclosed. The number of embodiments disclosed in the specification is not determinative of the meaning of disputed claim terms. *Teleflex Inc. v. Ficosa North Am. Corp.*, 299 F.3d 1313, 63 USPQ2d 1374 (Fed. Cir. 2002).

[290]

patented is not restricted to the examples but is defined by the words in the claims if those claims are supported by the specification. Where a specification does not require a limitation, that limitation should not be read into the claims.[84] While it is entirely proper to use the specification to interpret what the patentee meant by a word or phrase in the claim, this is not to be confused with adding an extraneous limitation appearing in the specification, which is improper.[85] If everything in the specification were required to be read into the claims, or if structural claims were to be limited to devices operated precisely as a specification-described embodiment is operated, there would be no need for claims. Nor could an applicant, regardless of the prior art, claim more broadly than that embodiment. Nor would a basis remain for the statutory necessity that an applicant conclude the specification with claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his or her

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[84] *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 6 USPQ2d 1601, 1604 (Fed. Cir. 1988). The fact that the examples showed only external plasticizers did not mean that the word "plasticizer" in the claims should be read to exclude internal plasticizers, where there was other evidence of record to support a broader interpretation. Also, some narrower dependent claims included external plasticizers as a limitation, so that limitation should not be read into the broader independent claims.

[85] *E.I. duPont & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 7 USPQ2d 1129 (Fed. Cir. 1988). By "extraneous" is meant a limitation read into a claim from the specification wholly apart from any need to interpret what the patentee meant by particular words or phrases in the claim. *Id.*

invention.[86] Just because a patent is narrow does not mean that the claims are to be limited to the specific embodiments disclosed in the specification.[87]

Nonetheless, it would run counter to the requirement that a claim particularly point out and distinctly claim the invention were an inventor to expressly state, throughout the application and claims, that the invention includes a particular limitation, and then be allowed to avoid that limitation in a later infringement suit by reference to one paragraph in the specification that states an alternative lacking that limitation.[88] All rules of construction must be understood in terms of the factual situations that produced them, and applied in fidelity to their origins. Thus, it is true that the description of the preferred embodiment in the specification does not limit the claims to that embodiment. However, when the preferred

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[86] *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 227 USPQ 577, 585 (Fed. Cir. 1985).

[87] *Aktiebolaget Karlstads v. United States ITC*, 705 F.2d 1565, 217 USPQ 865 (Fed. Cir. 1983). References to a preferred embodiment, such as those often present in a specification, are not claim limitations. *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 9 USPQ2d 1289 (Fed. Cir. 1988). However, one cannot interpret a claim to be broader than what is contained in the specification and claims as filed. *Tandon Corp. v. United States ITC*, 831 F.2d 1017, 4 USPQ2d 1283 (Fed. Cir. 1987). Although the specification may well indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than such embodiments. *Electro Med. Sys. S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994).

[88] *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 19 USPQ2d 1500 (Fed. Cir. 1991).

embodiment is described in the specification as the invention itself, the claims are not necessar-

[291]

ily entitled to a scope broader than that embodiment.[89] Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question.[90] It is a truism that a claim need not be limited to a preferred embodiment. However, in a given case, the scope of the right to exclude may be limited by a narrow disclosure. In sum, the cases do not stand for the proposition that an applicant can broaden his or her claims to the extent that they are effectively bounded only by the prior art. Rather, they make clear that claims may be no broader than the

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[89] *Modine Mfg. Co. v. United States ITC*, 75 F.3d 1545, 37 USPQ2d 1609, 1612 (Fed. Cir. 1996). Here the specification was amended to change an original range of.015-.070 to a smaller range of .015-.040 inch. Thus, the claimed limitation "relatively small" was held not to extend to .070 inch. However, this did not preclude an attempt to show literal infringement for dimensions over .040 or to establish equivalency.

[90] *SciMed Life Sys. Inc. v. Advanced Card. Sys. Inc.*, 242 F.3d 1337, 58 USPQ2d 1059, 1062-63 (Fed. Cir. 2001). In *Honeywell Inc. v. Victor Co. of Japan Ltd.*, 298 F.3d 1317, 63 USPQ2d 1904 (Fed. Cir. 2002), the court distinguished *SciMed* on the ground that the patent in suit, unlike that in *SciMed*, did not contain explicit language disclaiming certain subject matter.

supporting disclosure, and therefore that a narrow disclosure will limit claim breadth.[91]

Claim terms cannot be narrowed by reference to the written description or prosecution history unless the language of the claims invites reference to those sources. In other words, there must be a textual reference in the actual language of the claim with which to associate a proffered claim construction. The case law demonstrates two situations where a sufficient reason exists to require the entry of a definition of a claim term other than its ordinary and accustomed meaning. The first arises if the patentee has chosen to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term. The second is where the term or terms chosen by the patentee so deprive the claim of clarity that there is no means by which the scope of the claim may be ascertained from the language used. In these two circumstances, a term or terms used in the claim invites--or indeed, requires--reference to intrinsic, or in some cases, extrinsic evidence to determine the scope of the claim language.[92] A party wishing to use statements in the written description to confine or otherwise affect a patent's scope must, at the very least, point to a term or terms in the claim with which to draw in those statements. Without any claim term that is susceptible of clarification by the written description, there is no legitimate way to narrow the property right. If one need not rely on a limitation to interpret what the patentee meant by a particular term or

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[91] *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 45 USPQ2d 1498 (Fed. Cir. 1998).

[92] *Johnson Worldwide Assoc. Inc. v. Zebco Corp.*, 175 F.3d 985, 50 USPQ2d 1607, 1610-11 (Fed. Cir. 1999).

phrase in a claim, that limitation is "extraneous" and cannot constrain the claim.[93]

[292]

Courts cannot alter what the patentee has chosen to claim as the invention. No matter how great the temptations of fairness or policy making, courts do not rework claims. They only interpret them.[94]

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[93] *Renishaw plc. v.. Marposs Societa' per Azione*, 158 F.3d 1243, 48 USPQ2d 1117 (Fed. Cir. 19981. It does not necessarily follow that nonnumerically limited descriptive terms, such as "substantially uniform," are defined according to the purpose of the invention. When the function served is not recited in the claim itself, it is not imported as a limitation. *Ecolab Inc. v. Envirochem Inc.*, 264 F.3d 1858, 60 USPQ2d 1173 (Fed. Cir. 2001).

[94] *Intervet Am., Inc. V. Kee-Vet Labs., Inc.*, 887 F.2d 1050, 12 USPQ2d 1474 (Fed. Cir. 1989). It is incorrect to construe the claims contrary to the specification, and then to hold the claims invalid because they are contrary to the specification; the claims are construed in accordance with the rest of the specification of which they are a part, and not contrary to it. *C.R. Bard Inc. v. M3 Sys. Inc.*, 157 F.3d 1340, 48 USPQ2d 1225 (Fed. Cir. 1998). In *Becton Dickinson & Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 17 USPQ2d 1097 (Fed. Cir. 1990), the district court reworked the claims to an extent that the Federal Circuit was moved to characterize as reflecting an "egregious misunderstanding of the law." On summary judgment, independent claim 1 was found not invalid but also not infringed, while independent claims 6 and 7 were found invalid for obviousness. The district court then proceeded to rewrite claims 6 and 7 as though they were dependent upon claim 1 and concluded that such hypothetical claims would be valid but not infringed, for the same reasons as claim 1.

Cautionary note. Despite the Federal Circuit's repeated protestations to the contrary, the author has come to the belief that sometimes it does in fact import limitations from the specification into the claims. In other words, it limits the claim coverage to the embodiment described in the specification without any articulable legal justification. In certain cases, the author has been entirely unable to discern a clear indication, in the patent documents, that the preferred embodiments has been described "as the invention itself," or to see how a person skilled in the art would understand that the inventor intended such a limitation. And yet the claims have been construed to be limited to that embodiment.

The author fully expects that the court, were it ever to be confronted with this view, would firmly disagree. Indeed, many or most practitioners might feel the author has misread the decisions. Nonetheless, the author feels strongly enough about this conclusion that he feels obliged to state it, and to offer some examples. Accordingly, those readers who are interested in the topic are invited to read and analyze the cases collected in the footnote,[95] and to make their own judgments.

The author also believes that the Federal Circuit is developing alternative techniques to achieve the same end

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[95] *Bell Atl. Network Serv. Inc. v. Covad Comm. Group Inc.*, 262 F.3d 1258, 59 USPQ2d 1865 (Fed. Cir. 2001); *Netword LLC v. Centraal Corp.*, 242 F.3d 1347, 58 USPQ2d 1076 (Fed. Cir. 2001); *SciMed Life Sys. Inc. v. Advanced Card. Sys. Inc.*, 242 F.3d 1337, 58 USPQ2d 1059 (Fed. Cir. 2001); *Globetrotter Software Inc. v. Elan Computer Group Inc.*, 236 F.3d 1363, 57 USPQ2d 1542 (Fed. Cir. 2001); *Watts v. XL Sys. Inc.*, 232 F.3d 877, 56 USPQ2d 1836 (Fed. Cir. 2000); *Wang Labs. Inc. v. America Online Inc.*, 197 F.3d 1377, 53 USPQ2d 1161 (Fed. Cir. 1999); *Toro Co. v. White Consol. Indus. Inc.*, 199 F.3d 1295, 53 USPQ2d 1065 (Fed. Cir. 1999).

result, i.e., no liability for infringement. See the discussion of *Gentry Gallery* in §5.4(e).

(d) Title, Abstract, and Drawing

The title of a patent appears to be nearly irrelevant to claim construction. Certainly, MPEP §606.01 provides that the examiner

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may require a change in the title if the proffered title is not descriptive of the invention claimed. However, it goes on to explain that "this may result in slightly longer titles, but the loss in brevity of the title will be more than offset by the gain in its informative value in indexing, classifying, searching, etc." Thus, as indicated by the MPEP itself, the purpose of the title is not to demarcate the precise boundaries of the claimed invention but rather to provide a useful reference tool for future classification purposes. In any event, if courts do not read limitations into the claims from the specification that are not found in the claims themselves, then they certainly will not read limitations into the claims from the patent title. Consequently, an amendment of the patent title during prosecution should not be regarded as having the same or similar effect as an amendment of the claims themselves by the applicant.[96] Despite the statement in PTO Rule 72(b) that the "abstract shall not be used for interpreting the scope of the claims," the court is willing to use the abstract as a source of intrinsic evidence as to the meaning of claims. It seems to feel

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[96] *Pitney Bowes Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 51 USPQ2d 1161, 1170-71 (Fed. Cir. 1999). See also *Moore USA Inc. v. Standard Register Co.*, 229 F.3d 1091, 56 USPQ2d 1225 (Fed. Cir. 2000).

that the rule is one that governs the conduct of patent examiners and does not address the process by which courts construe claims in infringement actions.[97]

It is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.[98]

(e) Prosecution History

The prosecution history can be utilized as a claim construction tool apart from the pure estoppel context (see §8.2).[99] Prosecution history is an important source of intrinsic evidence in interpreting

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[97] *Hill-Rom Co. v. Kinetic Concepts Inc.*, 209 F.3d 1337, 54 USPQ2d 1437, 1440 n.1 (Fed. Cir. 2000). See also *SciMed Life Sys. Inc. v. Advanced Card. Sys. Inc.*, 242 F.3d 1337, 58 USPQ2d 1059 (Fed. Cir. 2001).

[98] *Hockerson-Halberstadt Inc. v. Avia Group Int'l Inc.*, 222 F.3d 951, 55 USPQ2d 1487 (Fed.Cir. 2000). Thus, a reasonable competitor, being aware that figures in a patent are not drawn to scale unless otherwise indicated, would understand arguments in the prosecution history that clearly disclaim a particular construction even though those arguments might appear erroneous in light of the drawings. *Id.*

[99] *Advance Transformer Co. v. Levinson*, 837 F.2d 1081, 5 USPQ2d 1600 (Fed. Cir. 1988); *Moleculon Res. Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *McGill Inc. v. John Zink Co.*, 736 F.2d 666, 221 USPQ 944 (Fed. Cir. 1984). In *Jurgens u. McKasy*, 927 F.2d 1552, 18 USPQ2d 1031 (Fed. Cir. 1991), the court placed heavy emphasis on the examiner's reasons for allowance and the prosecuting attorney's apparent agreement with the examiner's claim interpretation as expressed in those reasons.

APPENDIX L

In Re:Certain Flooring Products
No. 337-TA-443
July 26, 2001

Open/Closed Session

[p.258]

Q. Now, you said that you sent your father more drawings during the first part of 1994?

A. Yes, that is correct.

Q. What kind of advancements were you making in terms of this invention you were working on or this project you were working on?

A. Well, I refined the locking system, and made some additions on it. For example, I added one more installation method that wasn't in the original Swedish application, and that is, well, more or less the same method that is described in the '907 patent in the U.S. right now. I also added some extra feature with the aluminum, where I made a solution where the aluminum strip, where mechanical attached to the floor board. In the Swedish patent, I have only glued it on the patent. So I made some - well, I made some refinements.

Q. Did you study different ways to configure the joint in different ways to join the patents during that period?

A. Yes, I had to think of several ways of how to join them together, snapping and angling and sliding and I had to think because I wanted to have - well, I wanted actually to have as good PCT application, I wanted that to be, well, include as much of my invention as possible.

Q. Did you come to any conclusions as to the best way

[p.259]

to make the product, that is the mechanical joint you were working on or the best way to assemble the panels?

A. Yes, I had to think because the patent agency told me that I was supposed to show the best, the best way, the best embodiment of the invention. And I had during this period noticed that if you include, if you include the small distance or play in the product, that will somewhat facilitate or make it easier to angle the product up and that of course would make it easier to release of disassemble. And it also facilitates somewhat the sliding of the product.

So I decided to include that in the PCT application because, well, I was told as I said to show the best embodiment, and I, at that time, thought that this was a good solution.

Q. So the concept of play is something that came up as you were working in the early part of '94 in connection with this design you were working on?

Mr. DIMATTEO: Objection, Your Honor, leading.

JUDGE LUCKERN: Sustained, Go ahead. Ask your next question.

BY MR. O'CONNOR:

Q. Did you – strike that.

I believe in your last answer, you used the word "play'?

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A. I used the word "play," yes.

Q. And what did you mean by that word?

A. The play, that is very, very small distance that you create between two surfaces. And the purpose of that is to, well, separate the surfaces somewhat. An example would be a piston in the cylinder, where you have a very small, small gap around the cylinder – the piston in order to, well, facilitate the movement.

So for me, for me, play is a very tiny space.

Q. You told us a minute ago about your Swedish application and the method that was disclosed in that application. I think you described it for the Court.

A. Yes.

Q. Could you describe that again, please?

JUDGE LUCKERN: Off the record.
(Discussion off the record)

JUDGE LUCKERN: Let's go back on the record. The question was: "You told us a minute ago about your Swedish application and the method that was disclosed in that application. I think you described it for the Court."

"Answer: Yes."
"Question: Could you describe that again, please?"

[p.261]

THE WITNESS: I will try to describe the method disclosed in the Swedish patent. And that is a method where you – you place, I call it the angle slide snap method. And this is because you perform that movement with the board that you install.

So you take a board and put it close to the board in front of it, in an angle, and hen you angle it down and then when it has entered a horizontal plane somewhat, you push it and slide it until the short end will connect. So therefore, you have the

angle slide and then you snap, you the angle the long side and you slide it until the short side will snap.

BY MR. O'CONNOR:

Q. And did your work in the early part of '94 result in any additional methods on joining, in addition to that method that you just described that was in the original Swedish application"

Q. In the spring of '94.

A. Yeah, then I had added more, several more – then I had added an additional method for installing it.

Q. What was that method?

A. That method was when you start with the short side, and you start to connect two boards by the short sides, and I referred to that angle – the angle

[p.262]

slide and angle method, because you angle in the short side of the floor panel and angle it down, and then slide it and angle again.

Q. Now, you said that your father asked you to generate more drawings in the first part of '94, correct?

A. Yes, that is correct.

Q. And did you prepare drawings and additional drawings and send them to your father?

A. Yes, I prepared several drawings and sent them to my father.

Q. by the way, the work you did during this phase, that is the early part of '94, did you use the same methodology that you had used the year before, that is this computer program methodology for studying the project?

A. Yeah. My way of engineering is my computer, so that is how I worked.

(3)

Supreme Court, U.S.
FILED
MAR 2 2 2004
OFFICE OF THE CLERK

No. 03-1187

IN THE

Supreme Court of the United States

ALLOC, INC., BERRY FINANCE N.V.
and VÄLINGE INNOVATIONS, AB,
fka VÄLINGE ALUMINUM, AB,

Petitioners,

v.

INTERNATIONAL TRADE COMMISSION, and
PERGO, INC., and ROYSOL, and
AKZENTA PANEELE + PROFILE GMBH,
and UNILIN FLOORING N.V.,
BHK OF AMERICA, INC. and
MEISTER-LEISTEN SCHULTE, GMBH,

Respondents.

ON PETITION FOR A WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF IN OPPOSITION FOR COMPANY RESPONDENTS

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QUESTIONS PRESENTED

I. Has the Federal Circuit properly articulated the well-settled principles of law governing when it is appropriate to refer to the specification and file history in construing a claim?

II. Did the Federal Circuit properly apply these well-settled principles to the facts in this case?

RULE 29.6 STATEMENT

Respondent Unilin Flooring N.V. (formerly known as Unilin Décor N.V.) states that Unilin Industries, N.V. is the parent corporation of Unilin Flooring N.V.. No publicly-held company owns 10 percent or more of Unilin Flooring N.V..

Respondent BHK of America, Inc. states that BHK Germany is the parent corporation of BHK of America, Inc. and that no publicly-held company owns 10 per cent or more of the stock of BHK of America, Inc..

Respondent Meister-Leisten Schulte GmbH states that it has no parent company and that no publicly-held company owns 10 per cent or more of its stock.

Respondent Pergo, Inc. states that Pergo, Inc. is wholly-owned by the Dutch company Pergo Holding B.V.. No publicly-held company owns 10 per cent or more of the stock of Pergo, Inc..

Respondent Akzenta Paneele + Profile GmbH states that W. Classen GmbH & Co. KG, a publicly traded company, is the parent company of Akzenta Paneele + Profile GmbH.

Respondent Roysol states that The Roysol Group is the parent company of Roysol and that no publicly-held company owns 10 per cent or more of the stock of Roysol.

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Alloc's petition presents no general legal issue meriting review. There is no division within the Federal Circuit over the principles of law regarding the proper use of a patent's specification and file history in claim construction. Those principles fully respect the claim-based system for defining inventions and inevitably call for patent-specific inquiries. Moreover the Federal Circuit's articulation and application of these principles in this case was correct. Petitioner's challenge to the decision presents only case-specific issues not appropriate for review by this Court.

COUNTER-STATEMENT OF THE CASE

I. Background

Petitioners Alloc, Inc., Berry Finance, N.V., and Välinge Innovation AB (collectively, "Alloc") filed a complaint under Section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337, in the International Trade Commission (the "ITC") on December 4, 2000. Petition for Certiorari ("Pet.") at 2. The complaint charged that the Company Respondents infringed three Alloc patents relating to mechanically-locking floor panels.[1] Appendix to Petition ("Pet. App.") at 5a. After a hearing, the administrative law judge (the "ALJ") issued a Final Initial Determination of non-infringement. *Id.* at 72a-322a. The ALJ

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1. U.S. Patent Nos. 5,860,267 (the " '267 patent"), 6,023,907 (the " '907 patent"), and 6,182,410 (the " '410 patent"). Pet. App. 5a. The three asserted patents share an identical specification and claim priority from the same Patent Cooperation Treaty ("PCT") application and a continuation of this application, issued as U.S. Patent No. 5,706,621 (the " '621 patent"). *Id.* The '907 and '267 patents are method patents. Pet. at 4.

construed all the asserted claims of the patents[2] to include a limitation requiring "play," a small space, in the joint between floor panels and, because none of the accused products had play, concluded that there was no infringement. *Id.* at 86a-193a.

Alloc and the ITC Investigative Staff appealed to the ITC. *Id.* at 44a. The ITC issued a Notice of Final Determination of No Violation of Section 337 on March 22, 2002 and an Opinion on the Issues under Review on April 11, 2002. Pet. at 2-3. The ITC adopted much of the ALJ's claim construction, including the construction requiring play in the joints. Pet. App. at 11a.

Alloc appealed to the Federal Circuit. *Id.* That court affirmed the ITC decision on September 10, 2003 and denied Alloc's petition for rehearing and rehearing *en banc* on November 17, 2003. *Id.* at 2a, 27a. On February 17, 2004, Alloc filed a petition for a writ of *certiorari*.

II. The Federal Circuit's Claim Construction

The Federal Circuit Court of Appeals began by reciting the familiar principles that "the claims define the scope of an invention" (citing *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc)) and "'[c]laim language generally carries the ordinary meaning of the words in their normal usage in the field of invention'" (quoting *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1367 (Fed. Cir. 2003)). Pet. App. at 11a, 12a. The court noted that reference to the specification, prior art, and other evidence is proper "to discern the context and normal usage of [the]

2. The asserted claims are: claims 1, 2, and 3 of the '907 patent; claims 19, 23, and 39 of the '267 patent; and claims 1, 26, 41, and 48 of the '410 patent. Pet. at 4.

words in [a patent] claim." *Id.* at 12a. (citing, e.g., *Hoechst Celanese Corp. v. BP Chems., Ltd.*, 78 F.3d 1575, 1579 (Fed. Cir. 1996)). Further, the majority observed that "a patent applicant may consistently and clearly use a term in a manner either more or less expansive than its general usage in the relevant art, thereby expanding or limiting the scope of the term in the context of the patent claims." *Id.* (citing *Middleton, Inc. v. Minn. Mining & Mfg. Co.*, 311 F.3d 1384, 1388 (Fed. Cir. 2002), and *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1342 (Fed. Cir. 2001)).

As to the role of the specification, the court reiterated the well-established need to respect both of two cautions: one against reading limitations appearing only in the specification into claims that carry a plain broader meaning; the other requiring that claims be construed in light of the specification. Pet. App. at 16a. The court also invoked the familiar notion that how those principles apply in a particular case "turns on how the specification characterizes the claimed invention." *Id.* (citing *Sunrace Roots Enter. Co. v. SRAM Corp.*, 336 F.3d 1298, 1305 (Fed. Cir. 2003)). The court explained that, while "it is impermissible to read the one and only disclosed embodiment into a claim without other indicia that the patentee so intended to the limit the invention" (citing *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1327 (Fed. Cir. 2002)), "it is entirely permissible to limit claims . . . where the specification makes clear at various points that the claimed invention is narrower than the claim language might imply." *Id.* (citing *SciMed*, 242 F.3d at 1345)).

Contrary to Petitioner's assertion that the court below "essentially ignored" the language of the claims, that court began its claim construction by setting out the words of certain representative claims and underlining the disputed

terms in each. Pet. at 17; Pet. App. at 6a-10a. These terms, which include "locking element," "displacing," "locking member," "locking means," and "displacement," relate to the structure of the Alloc floor panels and the method by which the panels are joined. Pet. App. at 6a-10a.

In interpreting the claim terms, the court concluded that the specification required play in every embodiment of the invention. Pet. App. 13a-17a. The specification described "the invention" (rather than a particular embodiment of the invention) as a system in which "a play exists" when the panels are joined together.[3] *Id.* at 13a. Figure 1 includes a Δ symbol, indicating play, and the description of figure 1 recites that there was play in the joint to allow mutual displacement

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3. The court cited the following text from the common specification in support of this conclusion:

> '[T]he *invention* . . . provid[es] a system for making a joint along adjacent joint edges of two building panels, especially floor panels . . . said system being characterized in that . . . the panels, when joined together, can occupy a relative position in said second direction *where a play exists* between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection.'

"'[T]he *objects of the invention* are achieved by means of a panel-joining system having the features recited in the appended claims.'"; and "'*The above and other features and advantages of the invention* will appear from the appended claims and the following description of the embodiments of the invention.'" Pet. App. 13a (emphasis added).

when the panels were joined together.[4] *Id.* at 14a. The specification recites that play permitted disassembly and reassembly,[5] and reiterates that the floor panel's second mechanical connection included play to permit the panels to be disassembled.[6] *Id.* at 14a-15a. Finally, the specification criticizes prior art floor systems without play and nowhere describes or depicts an embodiment without play. *Id.* at 15a.

The prosecution history clearly confirmed that "play is a key feature of the claimed invention." *Id.* at 18a-21a.

4. The cited text of this description reads,

> when the panels 1 and 2 are joined together, they can however occupy such a relative position in the direction D2 that there is a small play DELTA between the locking surface 10 and the locking groove 14. This mechanical connection in the direction D2 allows mutual displacement of the panels 1, 2 in the direction of the joint, which considerably facilitates the laying and enables joining together the short sides by snap action.

Pet. App. 14a.

5. Here, the text in the specification recited that the panels can be disassembled by the preferred method "even if the aforementioned play between the locking groove and the locking surface is not greater than 0.2 mm." Pet. App. 14a.

6. The cited text provides that the "invention" includes a second mechanical connection in which "a play exists between the locking groove and a locking surface on the locking element that is facing the joint edges and is operative in said second mechanical connection." The specification also recites that the second mechanical connection "is so conceived as to allow the locking element to leave the locking groove if the groove panel is turned about its joint edge angularly away from the strip." Pet. App. 14a-15a.

The International Preliminary Examination Report in the Patent Cooperation Treaty application — from which the patents asserted in this case claim priority — "based its conclusion of novelty on the claim's recitation of play in the system joint." *Id.* at 18a. The patentee represented to the United States Patent and Trademark Office (the "PTO"), during the prosecution of the '621 patent (the parent to the patents asserted here), that play was "important" because it allowed for displacement and disassembly. *Id.* The PTO examiner allowed certain claims of the '621 patent over a prior art reference on the basis that the prior art did *not* allow for displacement. *Id.* at 19a. And the patentee represented, after winning allowance because its invention permitted displacement, that certain amended claims, while not including the word "play," nonetheless described an invention that included play and, "'*as such*,'" permitted displacement. *Id.* at 19a-20a (emphasis added).

REASONS FOR DENYING THE PETITION

I. The Federal Circuit has properly articulated the well-settled principles governing the use of the specification and file history in claim construction.

Petitioner attempts to manufacture an issue meriting review by arguing that the law on the proper use of the specification in construing patent claims is in "disarray," that there is "confusion" regarding the use of the specification and file history in claim interpretation, and that the Federal Circuit's articulation and application of these principles represents a "deviation from the claims-based system." Pet. at 9, 17, 22. Petitioner is wrong on all points.[7]

7. Petitioner argues that this purported confusion leads to uncertainty as to the scope of claims which "is manifesting itself in (Cont'd)

The principles governing the proper use of a patent's specification and prosecution history in construing claims are well-settled and easily summarized. To ascertain the meaning of claims, the court considers three sources: the claims, the specification, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) ("*Markman I*"), *aff'd*, 517 U.S. 370 (1996) (quoting *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1561 (Fed. Cir. 1991)). Claim construction begins with the words of the claim. *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1324 (Fed. Cir. 2002).[8] Claim terms generally

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(Cont'd)

the extraordinary rate of reversal on claim interpretation." Pet. at 9. However, one of the two authors cited explicitly refutes this contention. *See* Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 Berkeley Tech. L.J. 1075, 1097 (2001) (Concluding that the high reversal rate is primarily a function of the application of the *de novo* review standard and noting that,

> [i]n *Markman I*, the Federal Circuit stated that the construction of patent claims starts with the claim language, as interpreted in light of the specification and the prosecution history. Since 1995, it has invoked and applied that approach consistently and reliably . . . Over time, claim construction should thus become more predictable and consistent.

8. Petitioner ignores the *Teleflex* case, when, in support of its charge that the law is unsettled, it cites to Judge Dyk's concurrence in *SciMed Life Systems, Inc. v. Advanced Cardiovascular Systems, Inc.*, 242 F.3d 1337, 1347 (Fed. Cir. 2001), which called on the Federal Circuit to provide additional guidance on proper claim construction. *Teleflex*, decided a year after *SciMed*, includes a lengthy

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take their ordinary meaning, if there is one. *Id.* at 1325. But claims must be read in view of the specification, which "may act as a sort of dictionary, explaining the invention and defining terms used in the claims." *Markman I*, 52 F.3d at 979. The prosecution history has also long been recognized as a vital source for the proper construction of claims, both for the light it sheds on interpreting terms in need of clarification and for its role in disclaiming otherwise-broader interpretations in order to secure the patent from the PTO. *Id.* at 980 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 33 (1966), and *Autogiro Co. v. U.S.*, 384 F.2d 391, 397 (Fed.Cir. 1967)); *see Teleflex*, 299 F.3d at 1326. Thus, "ordinary meaning" does not control a claim term's construction where, for example, the patentee sets forth a definition of the disputed claim term in either the specification or prosecution history; the specification or file history shows that the patentee limited the scope of the claims (by distinguishing prior art on the basis of a particular feature, expressly disclaiming subject matter, or describing a particular embodiment as important to the invention); the claim term deprives the claim of meaning such that a definite meaning can be determined only by reference to the specification and file history; or the claim is phrased in step- or means-plus-function format. *CCS Fitness, Inc. v. Brunswick Corp.*, 288

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discussion of this issue which greatly clarified existing law. *See* Gregory J. Gallagher, *The Federal Circuit and Claim Construction: Resolving the Conflict Between the Claims and the Written Description*, 4 N.C.J.L. & Tech. 121, 142 (2002) (*Teleflex* "articulate[s] a comprehensive standard" on the relative roles of the claims and specification, which "provides the appropriate amount of protection to [] patentee[s] while providing incentive for innovation" and, over time, will lead to greater certainty in claim construction).

F.3d 1359, 1366-67 (Fed. Cir. 2002). These principles are long-established.[9]

Contrary to petitioner's contention, these principles are in full accord with this Court's pronouncements on claim construction. It has long been established that "an invention is construed not only in light of the claims, but also with reference to the file wrapper or prosecution history . . . Claims as allowed must be read and interpreted with reference to rejected ones and to the state of the prior art." *Graham v. John Deere Co.*, 383 U.S. 1, 33 (1966). More recently, this Court in *Markman v. Westview Instruments, Inc.*, holding that

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9. These are venerable principles which the Federal Circuit has repeatedly expounded. *See Autogiro Co. v. U.S.*, 384 F.2d 391 (Fed. Cir. 1967); *Renishaw PLC v. Marposs Societa' Per Azioni*, 158 F.3d 1243 (Fed. Cir. 1998); *Phillips Petroleum Co. v. Huntsman Polymers Corp.*, 157 F.3d 866 (Fed. Cir. 1998); *Johnson Worldwide Assocs. v. Zebco Corp.*, 175 F.3d 985 (Fed. Cir. 1999); *Eastman Kodak Co. v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547 (Fed. Cir. 1997); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996); *Amhill Enters. Ltd. v. Wawa, Inc.*, 81 F.3d 1554 (Fed. Cir. 1996); *Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545 (Fed. Cir. 1996); *Fromson v. Advance Offset Plate, Inc.*, 720 F.2d 1565 (Fed. Cir. 1983); *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572 (Fed. Cir. 1984); *Envirotech Corp. v. Al George, Inc.*, 730 F.2d 753 (Fed. Cir. 1984); *Caterpillar Tractor Co. v. Berco S.p.A.*, 714 F.2d 1110 (Fed. Cir. 1983); *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182 (Fed. Cir. 1998); *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430 (Fed. Cir. 1988); *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323 (Fed. Cir. 2001); *All Dental Prodx, LLC v. Advantage Dental Prods., Inc.*, 309 F.3d 774 (Fed. Cir. 2002); *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336 (Fed. Cir. 2001); *Innovad Inc. v. Microsoft Corp.*, 260 F.3d 1326 (Fed. Cir. 2001); *DeMarini Sports, Inc. v. Worth, Inc.*, 239 F.3d 1314 (Fed. Cir. 2001); *Apple Computer, Inc. v. Articulate Sys.*, 234 F.3d 14 (Fed. Cir. 2000).

judges, not juries, should construe claims, relied critically on the settled principle that claim construction entails a "necessarily sophisticated analysis of the whole document," so that terms are defined to "comport [ ] with the instrument as a whole." 517 U.S. 370, 389 (1996). Still more recently, in *Festo Corp. v. Shiketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002), the Court approved the context-specific principles of claim construction laid out in *Autogiro*, 384 F.2d at 397.

Petitioner contends that, by acknowledging the role of the specification and prosecution history in claim construction, the Federal Circuit has deviated from the claims-based system by "expand[ing] the relative weight" of the specification, "inflat[ing] the importance" of the prosecution history and "diminish[ing] the relative importance of the claims." Pet. at 11, 22. But this Court's decisions, as just noted, and the long line of decisions in the Federal Circuit and its predecessor courts, make clear that the claims are *not* undervalued when the specification and prosecution history are examined in just the ways the Federal Circuit did in this case. As the Federal Circuit explained in *Eastman Kodak Company v. Goodyear Tire & Rubber Company*, 114 F.3d 1547, 1552 (Fed. Cir. 1998), "a construing court does not accord the specification, prosecution history, and other relevant evidence the same weight as the claims themselves," but refers to these sources to give the claim language its proper context. *See also Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 957 (Fed. Cir. 1983) ("That claims are interpreted in light of the specification does not mean that everything in the specification must be read into all the claims."); *SRI Int'l*, 775 F.2d at 1121 (the specification and file history are useful but the focus remains on the claims).

Petitioner's refusal to recognize virtually any role for the specification and file history in claim construction may be why Petitioner concludes that there is "inconsistency" in the Federal Circuit's application of its claim construction principles and that certain Federal Circuit rulings are "without any articulable legal justification."[10] Pet. at 11-12. The fact that particular specifications and prosecution histories have greater or lesser weight in different cases is simply the result of the fact that the inquiry as to the meaning of claims is inevitably context-specific. The process of claim interpretation — the "sophisticated analysis of the whole document" called for by this Court's decision in *Markman* — is, of necessity, an intensely context-specific exercise. The Federal Circuit has explained the unavoidable patent-specificity of the inquiry: "Whether an invention is fairly claimed more broadly than the 'preferred embodiment' in

10. In support of its "inconsistency" charge, Petitioner cites to a group of articles, all of which offer explanations for the high rate of reversal in patent cases. Several of the cited articles do not argue that the Federal Circuit's application of its claim construction principles is inconsistent. In fact, the thesis of one is that the Federal Circuit has given proper guidance on the issue. *See* Gregory J. Gallagher, *The Federal Circuit and Claim Construction: Resolving the Conflict Between the Claims and the Written Description*, 4 N.C.J.L. & Tech. 121 (2002). Others attribute the high reversal rate to poor claim construction by district court judges. *See* Andrew T. Zidel, *Patent Claim Construction in the Trial Courts: A Study Showing the Need for Clear Guidance from the Federal Circuit*, 33 Seton Hall L. Rev. 711 (2003) (rate of reversal primarily due to the poor construction skills of trial judges which would be improved by educating these judges as to how claims are drafted); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 Harv. J.L. & Tech. 1, 38-39 (2001) (recommends that expedited appeals process or system of specialized courts be established to take claim construction out of the hands of unskilled district court judges).

the specification is a question specific to the content of the specification, the context in which the embodiment is described, the prosecution history, and if appropriate the prior art." *Teleflex*, 299 F.3d at 1327. *See also*, *e.g.*, *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186-87 (Fed. Cir. 1998) ("there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification").

The Federal Circuit, speaking through Judge Bryson, recently explained the established principles and the inherent patent-specificity of their application. *Liebel-Flarsheim Co. v. Medrad, Inc.*, Nos. 03-1082, 03-1165, 2004 WL 241482 (Fed. Cir. Feb. 11, 2004). The court explained that the requirement to read claims in light of the specification and the prohibition against reading a limitation from the specification into a claim are the "twin axioms" of claim construction. *Id.* at 5. It added that, while "parties frequently cite one or the other [axiom] . . . as if [it] were sufficient, standing alone, to resolve [] claim construction issues," the "axioms themselves seldom provide an answer, but instead merely frame the question to be resolved." *Id.*

Petitioner's argument rests on its mistaken insistence on crediting only one of the "twin axioms" with validity as a principle of claim construction, and virtually ignoring the specification and prosecution history. This Court, however, has long held otherwise; so, too, has the Federal Circuit. While the particular application of the principles sometimes provokes disagreements — as does the particular application of statutory-construction principles — there is no need or warrant for this Court to review the principles of claim construction regularly being applied in the Federal Circuit.

II. The Federal Circuit's application of well-settled principles of law to the facts of this case was correct.

Petitioner also attempts to cast the court of appeals' claim construction in this case — a necessarily context-specific inquiry — as an issue meriting review. Petitioner's main argument is that the court below accorded too much weight to the specification and prosecution history. Pet. at 17. This argument fails because the majority properly applied correct principles of claim construction in reaching a decision. Petitioner then makes a variety of miscellaneous complaints relating to the Federal Circuit's claim construction, none of which are meritorious.

The court below started its claim construction by setting out non-controversial rules of construction and then properly interpreted the claims, reviewing the specification in order to determine what the claim terms meant in context and, in particular, whether the inventors had limited the claims to make clear that play in the joints was required. The court concluded that the specification described the "invention" rather than a single embodiment as including a play limitation.[11] Pet. App. at 13a-15a. The court also properly

11. In support of its claim that certain Federal Circuit decisions on claim construction are "without any articulable legal justification," Petitioner cites to the views of a single commentator, Robert L. Harmon. Pet. at 11-12. However, in quoting Mr. Harmon, Petitioner excised one important sentence (without indicating that any text had been removed). The full quote follows with the portion omitted by Petitioner italicized.

> *Cautionary note.* Despite the Federal Circuit's repeated protestations to the contrary, the author has come to the

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examined the prosecution history to see whether it comported with that interpretation. Finding that the prosecution history did confirm its determination, the court held that the claims included a play limitation. *Id.* at 22a. This method of analysis is perfectly consistent with this Court's principles of claim construction. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

Petitioner complains that the court below violated one tool of claim construction: the "claim differentiation" principle, which cautions against finding a limitation in one claim where the limitation exists in another claim. Pet. at 18-19. Here, a "play" limitation is present in terms in

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> belief that sometimes it does in fact import limitations from the specification into the claims. In other words, it limits the claim coverage to the embodiment described in the specification without any articulable legal justification. *In certain cases, the author has been entirely unable to discern a clear indication, in the patent documents, that the preferred embodiments has [sic] been described "as the invention itself," or to see how a person skilled in the art would understand that the inventor intended such a limitation. And yet the claims have been construed to be limited to that embodiment.*

Pet. App. at 489a-490a. The sentence that Petitioner omitted is important because, in this case, the Federal Circuit, in contrast to the approach condemned by Mr. Harmon, expressly relied on the fact that the specification repeatedly describes "the invention" (rather than a particular embodiment) as having play. Pet. App. 13a. Thus, even if Mr. Harmon's theory is correct, the decision in this case, is *not* a decision "without any articulable legal justification," the court below was correct in holding that the Alloc claims include a play limitation, and review is inappropriate.

claim 49 of the '410 patent – which was not asserted in this case. Pet. at 18. Even in general, however, it has long been recognized that the doctrine of claim differentiation is only one tool of construction, often not determinative, because it is common for patentees to seek multiple ways of capturing the same invention. *Fromson v. Anitec Printing Plates, Inc.*, 132 F.3d 1437, 1445 (Fed. Cir. 1997) ("this doctrine cannot, of itself, restore to [the patentee's] claims a scope that has been shown to be unwarranted"). *See Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991) (quoting *Autogiro*, 384 F.2d at 404) ("Claim differentiation is a guide, not a rigid rule. If a claim will bear only one interpretation, similarity will have to be tolerated."). *See, e.g., Tandon Corp. v. U.S. Int'l Trade Comm'n*, 4 U.S.P.Q.2d 1283, 1288 (Fed. Cir. 1987) (affirming the ITC's claim construction, which found a limitation in a one claim despite the limitation's presence in another, on the basis of the ITC's finding that the specification and prosecution history required so limiting the claim); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1269 (Fed. Cir. 1986) (interpreting independent claim to include a limitation even though limitation was present in dependent claim because interpretation was "clearly consonant with the implications of the rest of the patent and the intent of the patentee"); *Kraft Foods, Inc. v. Int'l Trading Co.*, 203 F.3d 1362, 1368 (Fed. Cir. 2000) (doctrine of claim differentiation overcome by specification and prosecution history).

In fact, the case that Petitioner cites, *D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570 (Fed. Cir. 1985), recognizes the limitations of the claim-differentiation doctrine and its inapplicability in circumstances like those presented here. Specifically, *D.M.I* points out that application of the doctrine may not be appropriate where, as here, the prosecution history

shows reliance on a narrow construction to obtain the patent in the PTO. *Id.* at 1575. Here, the court of appeals, given the compelling evidence supporting the inclusion of the play requirement (based on the specification and prosecution history), was not required to reject that construction because claim 49 uses "play" language expressly.

The balance of Petitioner's arguments hinge on its mischaracterization of the decision below, which disregards the court's careful exposition of the bases on which it ruled. First, citing to *Smith v. Snow*, 294 U.S. 1 (1935), Petitioner argues that the court of appeals, when finding a play requirement in the two method claims at issue, impermissibly construed method claims as being limited to the particular disclosed apparatus. Pet. at 19-20. This contention is just another version of Petitioner's blinkered view of claim construction. In *Snow*, the invention was a method for incubating chicken eggs using heated air, and there was no basis in the claim for restricting the method to a particular arrangement of the eggs, or means of guiding the heated air around them, shown in the specification: "neither [element was] requisite to the application of the principle which Smith discovered and claimed." 294 U.S. at 11. Here, "displacement" was part of Alloc's claims to a method of connecting floor panels, and the court below properly held, in construing that language, that play was required to achieve displacement. Pet. App. 15a.

Second, Petitioner contends that the court of appeals improperly limited the claims of its patents to the best mode as depicted in the specification; petitioner invokes the rule that the inventor is not limited to the mode depicted in the specification and argues that a contrary position "punishes the inventor for complying with [the best mode requirement]."

Pet. at 22. Again, Petitioner's argument mischaracterizes the decision below, and the claim-construction principle as well. The court below expressly and correctly stated the rule as proscribing courts from reading "the one and only disclosed embodiment into a claim *without other indicia that the patentee so intended to limit the claim.*" Pet. App. 16a (citing *Teleflex*, 299 F.3d at 1327) (emphasis added). The court of appeals, as detailed above, properly based its decision on a range of indicia, found in both the specification and the file history, that signaled that the invention was narrower than the claim language might imply. *See* Pet. App. 13a-21a.

In sum, Petitioner's efforts to fashion an issue deserving of review by challenging the Federal Circuit's analysis in this case is unsuccessful. The decision below was correct and resulted from proper application of well-established principles of claim construction. In any event, Petitioner's complaints relate only to patent-specific interpretation issues and are not appropriate for review by this Court.

CONCLUSION

For the reasons set out above, the Petition should be denied.

Respectfully submitted,

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No. 03-1187

In the Supreme Court of the United States

ALLOC, INC., BERRY FINANCE N.V., AND VALINGE INNOVATIONS AB, FKA VALINGE ALUMINIUM AB, PETITIONERS

v.

UNITED STATES INTERNATIONAL TRADE COMMISSION, ET AL.

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF FOR THE FEDERAL RESPONDENT IN OPPOSITION

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QUESTION PRESENTED

Whether the Federal Circuit properly interpreted the displacement and disassembly limitations of patent claims for certain flooring products in light of the specification and prosecution history of those patents.

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BRIEF FOR THE FEDERAL RESPONDENT IN OPPOSITION

OPINIONS BELOW

The opinion of the court of appeals (Pet. App. 3a-40a) is reported at 342 F.3d 1361. The opinion of the United States International Trade Commission (Pet. App. 41a-71a) is unreported.

JURISDICTION

The judgment of the court of appeals was entered on September 10, 2003. A petition for rehearing was denied on November 17, 2003 (Pet. App. 1a-2a). The petition for a writ of certiorari was filed on February 17,

2004 (a Tuesday following a holiday). The jurisdiction of this Court is invoked under 28 U.S.C. 1254(1).

STATEMENT

Petitioners Alloc, Inc., Berry Finance N.V., and Välinge Aluminum AB filed a complaint with the United States International Trade Commission alleging that Unilin Décor N.V., BHK of America, Inc., Meister-Leisten Schulte GmbH, Pergo, Inc., Akzenta Paneele + Profile GmbH, Tarkett, Inc., and Roysol violated Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. 1337, in the importation and sale of certain flooring products by reason of infringement of certain claims of U.S. Patents Nos. 5,860,267 (the '267 patent), 6,023,907 (the '907 patent), and 6,182,410 (the '410 patent). The Commission ruled that there was no violation of Section 337 because, *inter alia*, there was no infringement with respect to the patents at issue. The court of appeals affirmed the Commission's ruling.

1. Section 337 requires the Commission to investigate complaints brought by private parties to determine whether imported articles should be barred from entering the United States because of unfair practices in import trade. See 19 U.S.C. 1337. Section 337 investigations are generally based on allegations of infringement of intellectual property rights, usually patent infringement. Section 337 investigations are conducted in the first instance by a Commission administrative law judge (ALJ) pursuant to Section 337, implementing regulations, and the Administrative Procedure Act, 5 U.S.C. 551 *et seq.* After discovery, briefing, and an evidentiary hearing, the presiding ALJ issues an initial determination (ID) on whether there has been a violation of Section 337. The ID is then subject to review by the full Commission (consisting, when fully com-

posed, of six Commissioners), which may adopt, modify, or reverse the ID.

In this case, the dispute between Alloc and respondents turned on a single issue—whether the displacement and disassembly limitations of the Alloc patent claims require "play," *i.e.*, a gap between the locking surface and locking groove of a flooring panel edge lock. Each of the asserted claims recites a displacement or disassembly limitation.[1] If the displacement and disassembly limitations require "play," then respondents' flooring products do not infringe the claims at issue because their products have no "play" in the flooring edge lock. The Commission's ALJ construed the displacement and disassembly limitations of the flooring edge lock claims at issue to require "play" and accordingly found no infringement and no violation of Section 337. See Pet. App. 72a-322a. On review, the Commission adopted the ALJ's construction of the displacement and disassembly limitations of the flooring edge

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[1] Claim 1 of the '410 patent recites a "locking means * * * constructed so as to enable said adjacent panels * * * to be turned * * * in order to unlock said one-way snap lock" (*i.e.*, the disassembly function). See Pet. App. 411a. Claims 1 and 26 further recite an edge lock "for mechanically and releasably locking together" adjacent panels, *id.* at 410a, 415a-416a, and claim 39 recites that the edge lock is "constructed so as to allow mutual displacement of the panels in the direction of the long edges," and "the second mechanical connection along the long edges is so constructed as to allow the locking element to leave the locking groove," *id.* at 419a. Claim 1 of the '907 patent recites "displacing the new panel relative to the second panel," and that the panels are "displaceable in relation to each other in the direction of the adjacent joint edges." *Id.* at 343a, 344a. Claims 19 and 23 of the '267 patent recite "displacing the new one of the panels in its longitudinal direction," and claim 39 recites "displacing the new panel relative to the first panel." *Id.* at 377a, 379a, 388a.

lock claims at issue and determined, based on that construction, that respondents did not violate Section 337. See *id.* at 41a-71a.

2. Alloc appealed, and the court of appeals affirmed the Commission's decision. Pet. App. 3a-40a. The court relied on the established principle that patent claims are not interpreted in isolation but must be construed in light of the specification. Pet. App. 12a, 16a (citing *Markman* v. *Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996)). The court noted that the balance between interpreting claims in light of the specification, yet avoiding impermissibly importing limitations from the specification, "turns on how the specification characterizes the claimed invention." *Id.* at 16a.

The court found that the specification common to all the patents at issue teaches that the displacement and disassembly limitations of the edge lock require "play." See Pet. App. 13a-17a. The court cited extensively from the specification and found that "play" enables the claimed displacement of floor panels. *Id.* at 13a-15a. The court also noted that all the figures and embodiments disclosed in the asserted patents explicitly show or imply play. *Id.* at 15a. The court further observed that the specification "criticizes prior art floor systems without "play," because in the prior art flooring edge lock systems the flooring panels are "tightly urged against each other." *Ibid.* The specification does not disclose any non-"play" embodiments of the flooring panel edge lock. *Ibid.* The court accordingly concluded that the specification "read as a whole leads to the inescapable conclusion that the claimed invention must include play in every embodiment." *Id.* at 17a.

The court of appeals also found that the prosecution history confirmed its interpretation of the displacement

and disassembly limitations in light of the specification. Pet. App. 18a. It noted that, even though "play" itself is not specifically recited as a limitation in any of the claims at issue, the displacement and disassembly limitations at issue require "play" to perform their claimed functions. The court found that, in a series of application rejections and amendments, the applicant repeatedly emphasized that the unique feature of the flooring panel edge lock, which distinguished the claimed invention from the prior art, was the displacement and disassembly features of the flooring edge lock disclosed in the application. The examiner allowed the patent on the basis of those displacement and disassembly limitations after the applicant had specifically argued that "play" enabled those locking functions. See *id.* at 18a-20a. The court of appeals concluded that, "[b]ecause the applicant invoked play to overcome the prior art, which lacked displacement and disassembly, Alloc cannot now contend that the '621 patent claims a flooring system and method for installing that system without play. The applicant expressly disavowed systems without play during prosecution of the parent '621 application." *Id.* at 20a. See *id.* at 20a-22a.[2]

ARGUMENT

The court of appeals properly interpreted the patents at issue in accordance with the patent laws and the controlling judicial decisions. The court of appeals' ruling that the displacement and disassembly limitations of the patent claims for certain flooring products require "play" is correct and does not conflict with any

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[2] Judge Schall dissented. In his view, the majority should not have relied on the specification because it did not amount to a "manifest exclusion or restriction, representing a clear disavowal of claim scope." Pet. App. 31a-32a.

decision of this Court or any other court of appeals. That fact-based determination presents no issue warranting this Court's review.

1. Congress has granted the Federal Circuit exclusive appellate jurisdiction over a case in which the complaint alleges a claim arising under federal patent law. 28 U.S.C. 1295(a); see *Holmes Group, Inc.* v. *Vornado Air Circulation Sys., Inc.*, 535 U.S. 836 (2002). That court has developed a body of law respecting patent claim interpretation that sets out the role of the patent specification in construing claims. The court of appeals properly applied its decisions on that subject to the facts of this case.

The federal patent laws state that the "specification shall contain a written description of the invention, and * * * shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. 112, paras. 1, 2 (emphasis added). The court of appeals accordingly interprets patent claims in light of the description contained in the specification, *Markman*, 52 F.3d at 979, while taking care to "avoid impermissibly importing limitations from the specification, *Comark Communications, Inc.* v. *Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998)." See Pet. App. 16a. The court followed that approach in this case. See *id.* at 11a-17a.

Contrary to petitioners' contentions (Pet. 11-18), the court of appeals did not "expand[] the relative weight accorded to a patent's specification" (Pet. 11). Rather, the court interpreted the patent claims in light of the patentee's disclosure of the invention in the specification. The court used the specification to assist in determining what the inventor meant by the displacement and disassembly limitations of the claims at issue.

There is nothing novel in the court's approach. To the contrary, the court of appeals' methodology and ultimate decision are consistent with this Court's observation that a patent claim "term can be defined only in a way that comports with the instrument as a whole." *Markman* v. *Westview Instruments, Inc.*, 517 U.S. 370, 389 (1996).

Petitioners are likewise mistaken in contending (Pet. 14-16) that the court of appeals used the specification to change the meaning of the claims. As this Court has pointed out, "[t]he context may, undoubtedly, be resorted to, and often is resorted to, for the purpose of better understanding the meaning of the claims; but not for the purpose of changing it, and making it different from what it is." *White* v. *Dunbar*, 119 U.S. 47, 51-52 (1886). The court of appeals followed that instruction. It did not introduce a "play" limitation from the specification into the claims. Rather, the court recognized that the specification made clear that "play" is an essential feature of the invention because it enables the displacement and disassembly features of the flooring edge lock invention described in the claims. Pet. App. 13a. The court also recognized that the "play" described in the specification is not merely a feature of the preferred embodiment, but instead an essential element the invention. *Ibid.* The court of appeals properly considered the specification "only for the purpose of better understanding the meaning of the claim" and "not for the purpose of changing it and making it different from what it is." *Howe Mach. Co.* v. *National Needle Co.*, 134 U.S. 388, 394 (1890).

2. Petitioners are also mistaken in contending (Pet. 22) that the court of appeals "inflated the importance of the prosecution history as a tool in determining claim scope." This Court has held that the patentee bears the

burden of proving that an amendment made during the prosecution of the application before the PTO that narrows a patent claim was not made for a reason that would give rise to estoppel. *Festo Corp.* v. *Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 740 (2002); *Warner-Jenkinson Co.* v. *Hilton Davis Chem. Co.*, 520 U.S. 17, 33 (1997). Consistent with those decisions, the court of appeals held petitioners to the patentee's representations made in the application process that "play facilitated its novel system set forth in the revised claims." Pet. App. 20a.

Petitioners cite *Goodyear Dental Vulcanite Co.* v. *Davis*, 102 U.S. 222, 227 (1880), for the proposition that the prosecution history may not be used "to enlarge, diminish, or vary the language of a patent afterwards issued." See Pet. 22-23. That decision, which recognizes that a patentee may be estopped by prosecution history, see *Goodyear*, 102 U.S. at 228, 230, must be read in light of this Court's subsequent decisions in *Festo* and *Warner-Jenkinson*, which provide further elaboration on the relevance of the concept. The Court specifically stated in *Festo* that "[p]rosecution history estoppel requires that the claims of a patent be interpreted in light of the proceedings in the PTO during the application process," 535 U.S. at 733, and that the purpose of applying prosecution history estoppel is "to hold the inventor to the representations made during the application process and to the inferences that may reasonably be drawn from the amendment," *id.* at 737-738.

The court of appeals in this case properly held petitioners to representations made during patent prosecution and refused to allow petitioners to recapture non-"play" embodiments of the claimed flooring edge lock that were relinquished for claim allowance. See Pet.

App. 19a-20a. The court properly recognized that petitioners cannot "seek to recapture in an infringement action the very subject matter surrendered as a condition of receiving the patent." *Festo*, 535 US 734. In this instance, the patent applicant distinguished the invention from the prior art that lacked "play," and the patent applicant thereby excluded panels lacking "play" from the scope of the invention.

Petitioners' contention that the court of appeals misapplied the prosecution history rests in large part on their misunderstanding of that history and its relevance. The court of appeals observed that the applicant for the patents at issue surrendered non-play embodiments of the flooring edge lock during patent prosecution by explicitly arguing that the "play" was "important" because "it enables the panels to slide movably with respect to each other" (the claimed displacement function), and enables disassembly of the floor when required. See Pet. App. 18a-19a. The court of appeals properly rejected petitioners' contentions (see Pet. 25) that the applicant broadened the claims at issue by taking the word "play" out of the claims. As the court pointed out, the applicant argued to the PTO that, even though the new claim did not recite "play," "play" exists between the locking groove and the locking surface such that the "displacement of the panels is still facilitated." Pet. App. 20a. In any event, that fact-bound dispute does not warrant this Court's review.

3. Contrary to petitioners' assertions (Pet. 9), there is no "disarray in the Federal Circuit's case law on claim interpretation." As the court of appeals has recognized, there is some inherent tension between the claim construction canon that counsels against creating claims limitations from the specification and the competing canon that a claim must be read in view of its

specification. See *Renishaw PLC* v. *Marposs Societa' Per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998); see also *Comark Communications, Inc.*, 156 F.3d at 1186 ("We recognize that there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification."). Indeed, even the dissenting judge below acknowledged the "very fine line between" these competing considerations. Pet. App. 31a (Schall, J., dissenting). The court's decision properly reconciled those canons by referring to the specification for the limited purpose of better understanding the claims limitations at issue. See *id.* at 11a-12a, 16a.

Petitioners' contention of "disarray" rests on an incomplete account of the Federal Circuit's case law regarding the relevance of the specification and prosecution history in evaluating patent claims. For example, petitioners cite Judge Dyk's concurring opinion in *SciMed Life Systems, Inc.* v. *Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1342–1343 (Fed. Cir. 2001), for the proposition that the Federal Circuit has provided "inadequate guidance" on the role of the specification in construing the claims. Pet. 10. But even if that were so, since the *SciMed* decision, the Federal Circuit has decided *Teleflex, Inc.* v. *Ficosa North America Corp.*, 299 F.3d 1313 (Fed. Cir. 2002), which articulated a clear standard for determining when a claim term should be limited based on the specification and prosecution history. The court stated in *Teleflex* that:

> claim terms take on their ordinary and accustomed meanings unless the patentee demonstrated an intent to deviate from the ordinary and accustomed meaning of a claim term by redefining the term or by characterizing the invention in the intrinsic re-

> cord [*e.g.*, the specification and prosecution history] using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.

Id. at 1327. See Pet. App. 16a.[3]

The court of appeals properly applied that standard in this case by employing the specification and prosecution history as an aid in construing the displacement and disassembly limitations of the patent claim. The court interpreted those limitations in light of the specification and prosecution history, but avoided impermissibly importing limitations from those sources. See Pet. App. 11a-22a. Further review is unwarranted.

4. Petitioners challenge the court of appeals' decision on several other grounds that are also without merit. For example, petitioners rely on the doctrine of claim differentiation, asserting that, because claim 49 in the '410 patent calls for "play," that limitation should not be read into claim 39 of that patent. Pet. 18-19 (citing *D.M., Inc.* v. *Deere & Co.*, 755 F.2d 1570, 1574 (Fed. Cir. 1985)). But as the Federal Circuit has made clear, "[t]he doctrine of claim differentiation cannot broaden claims beyond their correct scope, determined in light of the specification and the prosecution history and any relevant extrinsic evidence." *Wang Labs, Inc.* v. *America Online, Inc.*, 197 F.3d 1377, 1384 (Fed. Cir.

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[3] See also Gregory J. Gallagher, *Recent Development: The Federal Circuit and Claim Construction: Resolving the Conflict between the Claims and the Written Description*, 4 N.C. J.L. & Tech. 121 (Fall 2002) ("In a recent case, *Teleflex, Inc. v. Ficosa North America Corp.*, the Federal Circuit articulated a comprehensive standard that resolves this conflict [between the claims and the written description in determining the scope of a claim] and provides the appropriate amount of protection to a patentee while providing adequate incentive for innovation.").

1999) (quoting *Multiform Dessicants, Inc.* v. *Medzam, Ltd.*, 133 F.3d 1473, 1480 (Fed. Cir. 1998)). See *D.M., Inc.*, 755 F.2d at 1574 & n.2 ("Claims are always interpretable in light of the specification and prosecution history of the application that led to the patent.").

Petitioners also describe the '907 and '261 patent claims as "method" claims and rely on this Court's statement in *Smith* v. *Snow*, 294 U.S. 1, 20 (1935), that "[r]espondents do not avoid infringement of the method by varying the details of the apparatus by which they make use of it." Pet. 19-20. But that statement is inapposite here because the "method" that petitioners claim in their '907 and '261 patents requires "play." See Pet. App. 6a-8a, 13a & n.3. As the court of appeals explained, the specification and prosecution history of the patents at issue expressly state that it is the "play" in the flooring lock which "allows" and "enables" the recited displacement and disassembly functions of those method claims. *Id.* at 13a-22a.

Finally, there is no merit in petitioners' suggestion (Pet. 26 n.15) that the court of appeals' decision reflects the minority view of only two Federal Circuit judges. Petitioners requested rehearing en banc, and the full court of appeals denied that petition, with only one recorded vote in favor of en banc review. See Pet. App. 1a-2a. The court of appeals properly concluded that the decision does not warrant further review.

CONCLUSION

The petition for a writ of certiorari should be denied.

Respectfully submitted.

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